ADAPTATION FUND BOARD SECRETARIAT TECHNICAL REVIEW OF PROJECT/PROGRAMME PROPOSAL

PROJECT/PROGRAMME CATEGORY: CONCEPT NOTE

Country/Region: Belize
Project Title: Strengthening Disaster Preparedness, Early Warning Systems, and Climate Resilient Housing
Thematic Focal Area: Disaster Risk Reduction or Urban Development
Implementing Entity: Protected Area Conservation Trust (PACT)
Executing Entities: Protected Area Conservation Trust (PACT)
AF Project ID:
IE Project ID: **Requested Financing from Adaptation Fund (US Dollars):** 25,000,000
Reviewer and contact person: Mahamat Assouyouti **Co-reviewer(s):**
IE Contact Person:

Technical Summary	The project "Strengthening Disaster Preparedness, Early Warning Systems, and Climate Resilient Housing" aims to strengthen national disaster preparedness and response capacities, improving hurricane monitoring and early warning systems, and promoting climate-resilient housing and infrastructure through an innovative financing mechanism. This will be done through the three components below: Component 1: Enhance the Capacity of Belize's National Emergency Management Organization (USD 2,000,000); Component 2: Support to the National Meteorological Service for Enhanced Hurricane Monitoring and Tracking (USD 2,000,000); Component 3: Climate-Resilient Housing and Critical Infrastructure through Innovative Finance for Vulnerable Communities in Belize (USD 18,000,000). Component 4: Monitoring and Evaluation (USD 800,000). Requested financing overview: Project/Programme Execution Cost: USD 342,000 Total Project/Programme Cost: USD 23,142,000 Implementing Fee: USD 1,858,000

	Financing Requested: USD 25,000,000 The proposal includes a request for a project formulation grant of USD 150,000. However, the PFG request is not included in the CN package. The initial technical review raises several issues, such as the need for strengthening the adaptation rationale of the various components, the identification of potential risks and impacts of the project, the lack of information about potential overlapping projects, the absence of initial gender assessment and the project's cost-effectiveness, as is discussed in the number of Clarification Requests (CRs) and Corrective Action Requests (CARs) raised in the review. The second technical review raises several issues such as, the need to complete the IE certification, improving on the component description, alignment with results framework and environmental and social principles of the Adaptation Fund, addressing USPs; PFG amendments etc. As indicate in the various CRs and CARs below.
Date:	November 10, 2025

Review Criteria	**Questions**	**First Technical Review Comments September 2, 2025**	**Second Technical Review Comments November 10, 2025**	**AE Responses**
Country Eligibility	1. Is the country party to the Kyoto Protocol, and/or the Paris Agreement?	**Yes.**	-	
	2. Is the country a developing country particularly vulnerable to the adverse effects of climate change?	**Yes.** In Belize, climate change has intensified hydro-meteorological hazards, increasing both the immediate and medium-term vulnerability of the population. These changes are accompanied by significant inter- and intra-	-	

		annual climate variability. As a result, the country is experiencing more frequent and intense meteorological droughts, floods, storms, and hurricanes which exacerbate the country's vulnerability to climate change and limits its development.		
Project Eligibility	1. Has the designated government authority for the Adaptation Fund endorsed the project/programme?	**Yes.** As per the Endorsement letter dated August 5th, 2025. However, please see address the following: **CAR1**: Please complete the IE certification at IV section B.	**CAR1: Not Cleared.** Please complete the IE certification at IV section B including the requisite signature.	**Please note this has been completed on the last page of the concept**
	2. Does the length of the proposal amount to no more than Fifty pages for the project/programme concept, including its annexes?	**No** The concept note exceeds 50 pages including its annexes. **CAR2**: Please reduce the total pages within the required 50 pages	**CAR2: Cleared.** **CR1NEW:** 1. Please amend page 1 to change the submission stage and uncheck 1st submission. 2. Please add page numbers to the proposal.	**Please note this has been completed**
	3. Does the project / programme support concrete	**Yes.** **However additional information is required.** The concept note provides overall information about the		

	adaptation actions to assist the country in addressing adaptive capacity to the adverse effects of climate change and build in climate resilience?	components and activities aiming at addressing the vulnerability of homes and households to more frequent and severe climate hazards. However, there are few elements to be addressed: **CR1**: Beyond the overall description of the vulnerability and challenges caused by natural hazard on Belize housing sector, there is little information of how the proposed new resilient housing will address the impacts of climate hazards including increasing rain, sea rise, hurricane and others. Please explain how the newly proposed infrastructures will address the adaptative capacity of people, in particular if there are any specific building standards (national or international) or technology that help strengthen the infrastructure and prevent negative impacts.	**CR1: Not cleared.** 1. Thank you for the clarification and additional information. However, in addition to information provided under paragraph 77, please strengthen the section with climate data on recent and past climate hazards as well as climate projections, i.e floods, and how the proposed solution be aligned with resilient building. Even a very brief data analysis is sufficient at this stage, to inform the validity of the proposed options to building resilience based on past data benchmark. 2. Considering the frequency of category 4 and 5 Hurricanes	CR1: 1. Completed - Added "Belize's 2024 Building Code that is based on the ~~to national and~~ international building ~~standards~~ that integrates resilience standards.~~,~~ Resilient construction using reinforced concrete to withstand sustained winds of ~~111 – 129~~up to 157 mph, ~~ensure structural resilience against at minimum~~ (Category ~~3~~5) hurricane ~~wind loads~~, flooding, and storm surges. Furthermore, other k~~e~~y design features will include elevated foundations above flood risk levels (to elevate houses to a height that is above the most severe flood) to reduce exposure to flooding." The narrative has been revised to propose building structures that can withstand category 5 storms. **(revised on Subsection "Proposal solutions to the problem". Paragraph 78** Please note that additional historical information has been added to **paragraph 58.** This is just the basis to highlight trends of tropical systems that have impacted Belize over the years and highlight the frequency of the storms.

		CR2: Although the CN states that "as of September 2024, approximately 89,874 people across 20,562 households were living in multidimensional poverty, representing over 22.1% of the population", it is not clear how the proposed activities under component 3 and in particular the investment of 1,000 homes will address the overall vulnerability of populations exceeding the number of homes to be built or rehabilitated. Please clarify how the proposed investment will build resilience in transformative and long-term manner.	impacting the Caribbean, please clarify why the resilience efforts in limited to category 3. Example see para 77. **CR2: Not Cleared.** Thank you for the rationale behind the proposed number of houses and long-term approach proposed which is welcomed as presented at paragraph, 119, 128. At the fully developed proposal stage please ensure that any clarification on policy reforms or incentives that will be facilitate the dissemination of the new approach are articulated. 1. For the CN please indicate how the proposal will address the overall vulnerability of populations exceeding the number of homes to be built or rehabilitated. Additionally, please clarify how the proposed number of 350,000 beneficiaries across the country has been identified as this	2. Completed **– paragraph 78** and revised to target cat 4 and 5. **Completed - CR2:** 1. While the immediate reach is limited to 1,000 households, the investment is designed as a transformative pilot that strengthens structural, economic, and social resilience. By embedding climate-adaptive designs, fostering local economic participation, and integrating with broader development initiatives, the project creates a foundation for long-term poverty reduction and systemic change. The project will also complement existing housing projects and programs in Belize that are targeting single parents and persons with disabilities households. The targeted population will be mainly in the coastal areas, where the most vulnerable populations to hurricanes live. In Belize, around 57% of the total

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			represents nearly 85% of entire Belize population.	populations lives within 25 km from the coastline. 2. ~~This statement need to be rephrase - 'please clarify how the proposed number of 350,000"~~Thank you for you comments on the beneficiaries, please note that 350,000 would be indirect beneficiaries. The project will have indirect benefits to most of the population of Belize through enhanced disaster risk response, improved planning for the human settlement sector and improved coordination of national climate response plans. The direct beneficiaries of the project are expected to be around 5,000. **This has been articulated in paragraph 142.**
		CR3: While the CN states that "While this project will examine the vulnerability of the housing stock throughout the entire country, special emphasis will be given to those residing in high-risk, coastal communities", there is no clear approach to implement the project to avoid creating inequity and	**CR3: Not cleared.** The risk and vulnerability activity in the PFG valued at US$25,000 is noted. However, the proposal will be supported by providing the explanation provided in the review sheet within the proposal document itself. 1.	**CR3:** 1. Please note that on paragraph 142, we have added the total number of direct and indirect beneficiaries. 2. Thank you for your comments on the proposed beneficiaries. Please note that the targeted population will be those living in

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		exacerbate the vulnerability among population taking onto account existing social dimension. Please clarify the project approach to target vulnerable communities without creating additional social issues. Please elaborate how the beneficiaries will be selected taking onto account existing vulnerability factors. **CAR3:** Beyond the number of 1,000 houses to be built or rehabilitated, the CN doesn't provide an indicative number	Please include the response in the review sheet on CR3 in the proposal document and indicate the paragraph and page number in the next review sheet. 2.It is important to briefly describe the approach to avoid exacerbating vulnerabilities and maladaptation. Considering the nature of the proposed intervention which involves infrastructure and considering the increasing and existing vulnerability, please elaborate further the beneficiary's identification including inclusion of some the selection criteria described in the review sheet responses. There is currently very limited information on beneficiary eligibility criteria. **CAR3: Not cleared** Thank you for the additional clarification.	coastal communities who would directly benefit of new or improved houses that will be able to withstand hurricanes up to category 5. The selection criteria will be refined during the full project proposal development. CAR3: Thank you for your comment, please note that this has been

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		of beneficiaries. Please indicate the estimated number of beneficiaries (direct and indirect) which will be supported.	However, please clarify how the proposed number of 350,000 beneficiaries across the country as indicated at paragraph 140, has been identified as this represents nearly 85% of entire Belize population. .	addressed on **paragraph 142** of the concept.
		CAR4: Despite the fact that project focuses on climate-resilient housing, the CN does not specify a clear definitions and standard of the proposed "Climate-Resilient Housing and Infrastructure". Please explain and comment in the CN how the proposed "climate resilient housing" will build resilience in the context of Belize?	**CAR4: Not Cleared** We believe you refer to paragraph 125 which provide very generic information and references the national building code. Please strengthen the CN at para 174 and provide even indicative data on ***how*** the new construction will lead to increased resilience and be in compliance of the standards. Should they be new standards or techniques adopted, please describe it. Also refer to CR1 (2) above.	CAR4: Thank you for your comments, please note that we have added more context on **paragraph 127 and 176**
		CAR5: Please elaborate on the new standards to be established taking onto account the climate change	**CAR5: Not cleared** The paragraph 126 has not changed and new paragraph 125 does not	**CAR 5:** Thank you for your comments, please note that this has been addressed in **paragraph 127**

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		model for Belize and reference to the national disaster preparedness baseline assessment (Annex 2).	address this issue. Please clarify.	
		CR4: Kindly provide more details for each project activity, for example: clarify stakeholders to be involved), and which specific actions will be taken to ensure successful implementation of proposed climate resilient housing, and the locations (even tentative) where the constructions (housing and public buildings) will be done if already known at this stage.	**CR4: Not cleared.** The information and clarification provided on stakeholder's consultation is welcome. However, please amend the CN and include in the document the additional information included in the review sheet.	CR 4: Thank you for your comment, please note that this has been addressed under **Part 2, section A**
		CR5: Under Component 1, Output 1.3 "Critical infrastructure for hurricane response and recovery retrofitted to with flood protection, solar power, and water purification systems to ensure reliable hurricane response and recovery operations", please clarify what is meant by critical infrastructures and list them if already known. If not, please consider USP	**CR5: Cleared** As per clarification provided and updated CN, paragraphs 95-98.	**Cleared**

		approach in line with AF OPG guidelines. **CR6**: Under Component 1, Output 1.4 "Local disaster preparedness and response capacity is enhanced through strengthened data analysis, network administration, and disaster mitigation planning and policies" and component 2, Output 2.2 "Enhanced capacities in hurricane modelling and forecasting tools", there seem to be potential to strengthen the proposed approach for new "resilience housing" for long term sustainability and resilient of the infrastructures. Please clarify how the activities mentioned above will contribute to build a new "resilient housing" beyond the hard infrastructure component of the housing. **CAR6:** Under Component 2, the output 3.1 "Legal, financial, and institutional frameworks to ensure sustainable management	**CR6: Not cleared.** No narrative under output 1.4 is included under the component description. The description goes up to 1.3 and goes to Component 2. Please update the CN and refer to and align with the new policies under development with the information currently available Also include a notation that alignment and compliance will be further strengthened at fully-developed proposal stage. **Note:** Answers only in the review sheet does not constitute a response to the comments. The changes /clarification **must** be reflected in the proposal document for the comment to be cleared. **CAR6: Cleared.** As per clarification provided under paragraph 202.	CR6: Thank you for your comments, please note that this has been addressed on **paragraph 102 and 113** **CAR6: Cleared**

		and governance of the revolving fund for climate-resilient housing and infrastructure established" seems to be executed by a third-party entity named "Development Finance Corporation". However, the CN states on its cover note that PACT will execute the entire project. Please clarify the execution approach under the revolving fund and revise the CN accordingly. **CAR7**: Under Component 3, Output 3.2 "At least 1000 homes in vulnerable communities are retrofitted, upgraded, or relocated to climate-resilient standards", although the CN mentions that "The selection and implementation process will be guided by a thorough Environmental and Social Risk Screening to ensure that interventions minimize negative impacts and promote sustainability", please provide at this stage some indicative selection criteria which can be further developed during FP stage.	**CAR7: Not cleared.** The indicative selection criteria are well noted. However, please include the proposed criteria and additional information in the CN document. In addition, please clarify if there are separate selection criteria of beneficiaries' selection in addition to those for the revolving fund and if yes please detail them.	**CAR7:** Thank you for your comments, please note that this has been further clarified on annex name: **Memo re Climate Resilient Housing Product Design and Revolving Fund Framework**

		CR7: Under Component 4, mostly all funds are allocated to monitoring and evaluation and there is no other outputs and activities aiming at support concrete adaptation actions to assist the country in addressing adaptive capacity to the adverse effects of climate change and build in climate resilience. Please note that as per AF OPG and new evaluation policy, evaluation costs are included in the project implementation fees. Please revise the component 4 and including activities and outputs in accordance with AF OPG. **CAR8:** As required by AF, please add explicitly the alignment with the Adaptation Fund Results Framework in Part II section B.	**CR7: Cleared.** As per revised paragraphs 132-134. **CAR8: Not cleared.** 1. At paragraph 141 under Part II Section B, please include a sentence which indicates how the proposal is aligned with the AFs results framework. You may list the relevant outcomes to which the proposal is aligned.	**Cleared** CAR8: 1: Thank you for your comment please note that this ass been addressed on **paragraph 143**

			2.For the Demonstrate how the project/programme aligns with the Results Framework of the Adaptation Fund table at Part III A please amend the table to comply with the guidance and template as follows: • Results Framework Alignment Table (Amended in November 2025) (77 kB, DOC)	2: Please note that the table on **Part 3** has been revised to the request.
	3. Does the project / programme provide economic, social and environmental benefits, particularly to vulnerable communities, including gender considerations, while avoiding or mitigating negative	. Unsure. The concept note briefly outlines some project's economic, social, and environmental benefits; however, the explanation is too general and with no estimated benefits. The document does not provide information on the expected total number of beneficiaries of the project and the specific vulnerable groups targeted. The concept note does not include an Initial Gender Assessment.	**CR8: Cleared.**	

	impacts, in compliance with the Environmental and Social Policy and Gender Policy of the Fund?	CR8: Please include in the economic benefits section, how many people will benefit in each community and what is the dollar-value of the economic benefit to them for each of the target communities. It would also be useful to present overall figures for economic and social benefits. CR9: Please strengthen the social, and environmental benefits with specific and quantifiable data where possible. **CAR9:** Please include an initial gender assessment which is required at the concept note stage. **CAR10:** Kindly provide specific information on the expected beneficiaries, disaggregated by gender and age, where possible. Also, whether marginalized and vulnerable groups and indigenous communities have been identified in the project area and if so, to specify how the project benefits those groups.	As per information in initial gender assessment. **CR9: Cleared.** As per information in initial gender assessment. **CAR 9: Cleared.** An initial gender assessment was provided with the re-submission. **CAR10: Cleared.** Thanks for providing the estimated number of direct and indirect beneficiaries at paragraph 140. However, to be compliant with the Gender Policy please provided the information disaggregated by gender at the fully-developed proposal stage. This information can draw on already existing gender studies or sectoral or country reports to provide	

		CR10: As raised in CR3, kindly explain how the project will ensure the equitable distribution of benefits.	some indicative information. Please consult Gender Guidance Document for Implementing Entities on Compliance with the Adaptation Fund Gender Policy (Updated in 2022). **CR10: Not cleared.** This CR has not been addressed, also please refer to to CR3 above.	**CR10:** Please note this has been addressed on paragraph 127, where we have clarified how the distribution of the beneficiaries is determined and linked to coastal communities. The full proposal will further develop the most suitable scope of the program
	4. Is the project / programme cost effective?	**Unsure.** The concept note provides a broad explanation of the project cost-effectiveness including a comparative table on pages 44-48 (BAU vs proposed interventions). However, the document lacks details on cost-effectiveness approach with alternative options and measures beyond the BAU scenario. For now, it is not possible to demonstrate the cost-effectiveness of the selected measures.		

		CAR11: Kindly provide a sound justification for the cost-effectiveness of the project and selected measures, including scope, approach, alternative options to the proposed measures, and estimates of the evaluation where possible. Please consider update the table in pages 44-48 to include tentative cost figures for benchmark and alternative solutions of the proposed infrastructures and solutions.	**CAR11: Not cleared** 1. The response provided in the review sheet suggests that the review within MET/PACT is not yet finished. Please revise the CN based on available information on cost-effectiveness and update pages 44-48 accordingly.	**CAR 11:** Thank you for your comment, please note that this has been clarified on **paragraph 155**
	5. Is the project / programme consistent with national or sub-national sustainable development strategies, national or sub-national development plans, poverty reduction strategies, national communications and adaptation programs of action and	**Yes.** **But further information is needed.** The project identifies relevant adaptation-related plans and strategies for Belize as well as sectoral country's policy and strategies including losses and damages. However, the document lacks reference to SDGs and other development indicators. **CAR12:** Kindly provide specific linkage about how the project supports the implementation of the SDGs.	**CAR12: Cleared.** As per revised Section E, paragraph 175-182	

	other relevant instruments?			
	6. Does the project / programme meet the relevant national technical standards, where applicable, in compliance with the Environmental and Social Policy of the Fund?	**Yes.** **But further clarification is needed.** The concept identifies several national regulations relevant to the project as described in Section D and E, Part II, including the Environmental Protection Act Chapter 328 of the Substantive Laws of Belize Revised Edition 2020, Belize Building Act Chapter 131 and the National Land Use Policy for Belize (2025-2035). **CAR13**: However, considering the newly proposed "resilience housing and infrastructure", please clarify and elaborate in the CN if the existing standards are sufficient or a need for	**CAR13: Cleared** As per revised CN paragraph 78 and 174.	

		new approach and standards for climate-proofed infrastructure.		
	7. Is there duplication of project / programme with other funding sources?	**Yes.** **However additional information is required.** Although relevant information is described to the minimum extent in Section F, Part II, all potentially overlapping projects are not clearly identified in the concept note. **CR11:** Kindly conduct more analysis and include a comprehensive list of projects that are or have been implemented in Belize and the selected area. Please consider using a table format to demonstrate the complementarity and non-duplication if any.	**CR11: Cleared** As per revised CN with new table under paragraph 180.	
	8. Does the project / programme have a learning and knowledge management component to capture and feedback lessons?	**Yes. However, amendment is required.** Although the information provided on section G, Part II describes the project learning and knowledge approach, there is no dedicated component or activity in the project funding table associated with KM.	**CAR 14: Not cleared.**	**CAR14:Cleared** Paragraph 183 - 194

		CAR14: Please strengthen the project KM part beyond the section G. Please consider revising the project component 4 and including the knowledge and dissemination-related activities which are currently spread among the 3 other components.	We believe you refer to paragraph 186 and not 190. There is still very generic and brief sentence about KM dissemination. Please revise and strengthen this section in line with previous comment under CAR14.	
	9. Has a consultative process taken place, and has it involved all key stakeholders, and vulnerable groups, including gender considerations in compliance with the Environmental and Social Policy and Gender Policy of the Fund?	**Unsure.** The CN indicates that initial consultations were conducted through focus groups and one-on-one interviews. The consultative process has included local authorities, government entities, and communities. However, there is no annex or mention of the persons who have been consulted nor the locations. **CAR15:** Kindly indicate whether any physical consultation has taken place and include the list of stakeholders in Annex, including if possible one or two images.	**CAR15: Not cleared** Since there has been consultations on the ground, please include in Annex the list of stakeholders consulted. **CAR16:** At this point, the CN development has consulted with their relevant umbrella	**CAR15:** Thank you for your comment, please not that consultations have been focused at this point to NEMO, NMS, NHS, PACT, DFC and MET/DA, with the relevant staff from the respective entities. There has not been consultations at the community level yet. **CAR16:** This is directly related to CAR 15

		CAR16: Considering the important role of vulnerable groups including women and youth, kindly explain how these groups been involved during consultation workshops.	organization and ministries representing these groups.	
	10. Is the requested financing justified on the basis of full cost of adaptation reasoning?	**Unsure.** The concept note provides general arguments for the funding of the project and its impact on Belize and selected areas. However, the demonstration of how the project will address solely its adaptation objective is not fully clear with the resources provided is not clear. **CR12:** Please present information to indicate how this project will meet its objectives solely with the resources of the adaptation fund. **CR13:** Kindly clarify whether the project requires co-financing or not. If co-financing is being considered, please clearly indicate how the project with the AF resources only, will be able to effectively meet its objectives.	**CR12: Cleared** As per paragraph 202 **CR13: Cleared** As per confirmation that there is no co-financing, ref. Paragraph 202	

		CAR17: Considering that most of the proposed activities under component 2 (infrastructures) are to be designed or identified (standards for resilient housing), kindly confirm if this project will be implemented through an approach of unidentified sub-project (USP). **CR14**: Given that the project will establish a "revolving housing finance facility, which will provide low-interest loans to working poor households", please clarify how the AF funding	**CAR17: Not cleared.** The current proposal reads like a proposal with USPs Fully unidentified USPs within a fixed framework. Please consult the AF USP guidance below and make the necessary amendments. Please note that if USPs are present, be it explicit or de facto, the project fully-developed proposal must include an Environmental and Social Management Plan (ESMP) that includes a detailed, budgeted process to apply the ESP and the GP to each USP as and when it is being identified. • Guidance Document for Project/Programme with Unidentified Sub-Projects **CR14: Not cleared.** We are not able to find a revised text under paragraphs 126-182 that addresses this CR14.	**CAR 17:** This is exactly right, the program will be developed as a USP during full proposal development and elaborated on **paragraph 143.** **CR14:** Thank you for your comment. The grant base to support a revolving fund is meant to support the long-term sustainability of the investment to have the desired

		will meet its full cost of adaptation reasoning with a grant-based instrument. Please clarify how the low-interest loans return will be aligned with AF requirements for full cost of adaptation reasoning.	Please provide a clear reference.	adaptive impact. Further clarified on **paragraph 117**
	11. Is the project / program aligned with AF's results framework?	**Yes, however amendment is required.** Although the CN includes information under section A, Part III on the results framework, the document doesn't not fully demonstrate the project alignment with AF's results framework. **CAR18**: Please add at least one Project objective indicators to the project results framework, allowing the project to track progress towards the achievement of the project objective. This may be one or several core impact indicators.	**CAR 18: Not cleared** Please refer to CAR8 (2).	**CAR 18:** Thank you for comments, please note that this has been addressed on the table on **PART 3**
		CAR19: Several indicators of the project results framework are measured using "number or % of communities" as a unit. In line with the methodologies	**CAR 19 and 20**: Not **Cleared.** Please refer to CAR8 (2).	**CAR19 and 20:** Thank you for your comment, please note that the information has been updated as requested on the table in **Part 3**

		for reporting on indicators, all data should be reported in terms of number of people or another unit that can be easily tracked. Please review and revise all relevant indicators and associated targets in the project results framework to ensure consistency with AF guidelines, specifically ensuring that all data are expressed in number of people. Remove any reference to households where applicable. Please be guided by the template available at • Results Framework Alignment Table (Amended in March 2019) (77 kB, DOC) **CAR20**: Please ensure a consistent use of "Number" or "#" throughout the project results framework.		
	12. Has the sustainability of the project/programme outcomes been taken into account when	**Yes.** **However additional information is required.** The project seeks to sustain its benefits mainly through a key sustainability mechanism with the		

	designing the project?	establishment of a revolving housing finance facility. It is not clear how the involvement of national and local stakeholders will be done to fostering community ownership, and building capacity for end users. **CR15:** Kindly identify the sustainability approach and mechanism beyond the revolving fund. Please explain how the adaptation benefits will be sustained after this project ends and explain if this can be replicated and/or scale up. **CAR21**: considering that the proposed resilient housing will be newly introduced to Belize, please identify the O&M mechanism and implementation modality to ensure project sustainability.	**CR15: Not cleared** As stated in the CR15, the sustainability approach should be for entire project and not only the revolving fund. Kindly revise the proposed approach and extend it to entire project. **CAR21: Not cleared** Thank you for the clarification and the adoption of a collaborative and inclusive approach. However, please provide at least details of an indicative O&M mechanism.	**CR15:** Thank you for your comment, please note that this has addressed on **paragraph 82** **CAR21:** Thank you for your comment, please note that this is provided on the annex from the DFC who has developed a baseline on how this will work. This will be further elaborated during the full proposal development.
	13. Does the project / programme provide an overview of environmental	**Yes.** **However, further information is required.** The concept note does not state the project		

	and social impacts / risks identified, in compliance with the Environmental and Social Policy and Gender Policy of the Fund?	classification (A, B or C) from the screening. The proposal has not identified all potential risks and impacts but rather provides some general information about some of the environmental and social principles from the checklist. For the concept note, the ESP overview should start by identifying potential risks, even if the project aims not to affect issues related to the principles. **CAR22:** Please kindly state the project classification from the screening in Section K, Part II. **CAR23:** Please review Table in page 68 and assess all the principles that may apply to the project, and state and describe all potential impacts and risks in particular regarding the unidentified subprojects if any (resilient housing and public infrastructures). Please refrain from using "n/a" as the project has to be screened against all principles. Please note that ESPs 1, 4 and 6 will always require further assessment.	**CAR 22: Cleared.** As per project category B reflected on section K Part II **CAR 23: Not Cleared.** Thank you for revised table under Section K Part II has been revised. However, please refer to CAR17 and ensure compliance with AF ESP and gender policy. **CAR 24: Cleared** As per the initial gender assessment included	**CAR 23:** Thank you for your comment, please note that the program will be developed as a USP, to more details will be provided during full proposal development and mentioned on **paragraph 143**

		CAR24: Please include an initial gender assessment. **CR16**: Please confirm if the project includes USP in particular for activities involving construction (housing and public infrastructures) and refer to AF policy of USP for compliance.	**CAR 16: Not cleared.** Please see above CAR17 related to USPs.	**CAR 16:** Thank you for your comment, please note that this has been addressed on **paragraph 143**
Resource Availability	1. Is the requested project / programme funding within the cap of the country?	**Yes.** **But further clarification is needed** **CAR25:** Please attach the request for PFG of $150,000 as announced in the CN document. **CAR26:** The funding requested on the cover of the proposal is US$25M, which does not correspond with the amount in the project financing and components section. Please correct and align all figures throughout the document.	**CAR25: Cleared** A PFG request has been added **CAR 26: Cleared.** The funding table is now aligned with the $25M request.	
	2. Is the Implementing Entity Management Fee at or below	**Yes.** However, amendment is required in regard to overall project financing breakdown. EE cost seem to be wrong.		

	8.5 per cent of the total project/programme budget before the fee?	**CAR27:** Ref to CAR28 below For further clarification on the costs and fees please refer to More information, please visit: https://www.adaptation-fund.org/generic/costs-and-fees/.	**CAR 27: Cleared** See below CAR28	
	3. Are the Project/Programme Execution Costs at or below 9.5 per cent of the total project/programme budget (including the fee)?	**No.** **CAR28**: Since PACT is acting as both IE and EE, please only 1.5% of the EC costs can be allocated to PACT. The cover page only lists PACT as the EE however; the endorsement letter indicates that Both PACT and DFC will execute the project. 1. Please update the cover page to reflect this or provide an updated endorsement letter. 2. Please note that justification for the IE to serve as the	**CAR 28: Cleared** As per revised cover page.	

		EE is required and should be provided with the re-submission.		
Eligibility of IE	1. Is the project/programme submitted through an eligible Implementing Entity that has been accredited by the Board?	**Yes.** PACT accreditation is active until April 2030.	**CAR29 (NEW):** 1. Please amend para 203 since PACT is the IE to remove the statement on the DA implementing. 2. Please revise start date of PFG to after AFB46. IN PFG form item 2 column 3 total should be $20,000 not $15,000. Item 5- please ensure that the FDP has na ESMP and this line item includes its development if needed.	**CAR 29** **1: This has been addressed on paragraph 205** **2: Thank you for your comment, this has been addressed on the PFG form**
Implementation Arrangements	1. Is there adequate arrangement for project / programme management, in compliance with the Gender Policy of the Fund?	n/a at concept stage		
	2. Are there measures for financial and project/progra	n/a at concept stage		

	mme risk management?			
	3. Are there measures in place for the management of for environmental and social risks, in line with the Environmental and Social Policy and Gender Policy of the Fund?	n/a at concept stage		
	4. Is a budget on the Implementing Entity Management Fee use included?	n/a at concept stage		
	5. Is an explanation and a breakdown of the execution costs included?	n/a at concept stage		
	6. Is a detailed budget including budget notes included?	n/a at concept stage		
	7. Are arrangements	n/a at concept stage		

	for monitoring and evaluation clearly defined, including budgeted M&E plans and sex-disaggregated data, targets and indicators, in compliance with the Gender Policy of the Fund?			
	8. Does the M&E Framework include a break-down of how implementing entity IE fees will be utilized in the supervision of the M&E function?	n/a at concept stage		
	9. Does the project/programme's results framework align with the AF's results framework? Does it include at least one core outcome indicator from	n/a at concept stage		

	the Fund's results framework?			
	10. Is a disbursement schedule with time-bound milestones included?	n/a at concept stage		

ADAPTATION FUND

CONCEPT NOTE PROPOSAL FOR SINGLE COUNTRY

PART I: PROJECT/PROGRAMME INFORMATION

Title of Project/Programme: Strengthening Disaster Preparedness, Early Warning Systems, and Climate Resilient Housing

Country: Belize

Thematic Focal Area:

Type of Implementing Entity: National Implementing Entity

Implementing Entity: Protected Area Conservation Trust (PACT)

Executing Entities: Protected Area Conservation Trust (PACT)

Amount of Financing Requested: $25,000,000 (in U.S Dollars Equivalent)

Project Formulation Grant Request (available to NIEs only): Yes ☐☒ No ☐ ☐

Amount of Requested financing for PFG: $150,000 (in U.S Dollars Equivalent)

Letter of Endorsement (LOE) signed: Yes ☒ ☐ No ☐ ☐

NOTE: LOEs should be signed by the Designated Authority (DA). The signatory DA must be on file with the Adaptation Fund. To find the DA currently on file check this page: https://www.adaptation-fund.org/apply-funding/designated-authorities

Stage of Submission:

☐☒☐ This concept has been submitted before

☐☒ This is the first submission ever of the concept proposal

In case of a resubmission, please indicate the last submission date: Click or tap to enter a date.

Please note that concept note documents should not exceed 50 pages, including annexes.

Project/Programme Background and Context:

Provide brief information on the problem the proposed project/programme is aiming to solve. Outline the economic social, development and environmental context in which the project would operate.

Geographic and socio-economic context

1. Belize is a small (22,966 sq km or 8,867 sq mi), developing country located on the Caribbean coast of Central America. It shares borders with Mexico to the north, Guatemala to the west and south, and the Caribbean Sea to the east (Figure 1). The mainland makes up 95% of the territory and 5% is represented by more than 1,060 small islands or Cayes. The country's coastal and marine environment is an exceptional natural system, comprising a 386-kilometer (240 mi) coastline; more than 1,060 small sand and mangrove islands known as cays; a 300-kilometer (190 mi) barrier reef; and three of the four offshore atolls in the Western Hemisphere—Lighthouse Reef, Turneffe Atoll, and Glover's Reef. As the largest reef complex in the Atlantic-Caribbean region and the second-largest reef system globally, the Belize Barrier Reef Reserve System (BBRRS) is recognized for its unique diversity of reef types within a single area. It was designated a UNESCO World Heritage Site in 1996 (UNESCO 2025)

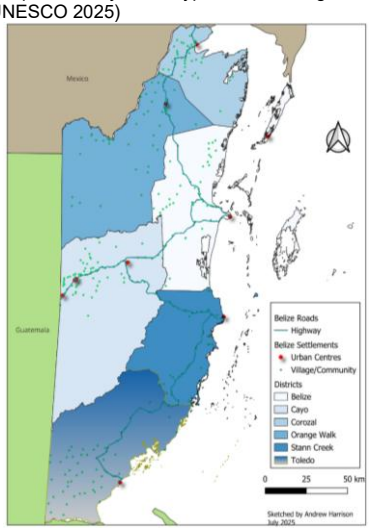


Figure 1: Map of Belize showing Administrative Districts and Urban ~~Center~~Centres
Source: GOB 2025

2. The mainland consists of two primary physiographic regions. The Maya Mountains and their associated basins and plateaus dominate the southwestern region, rising to just over 1,100 meters. In contrast, the northern lowlands and southern coastal plain are relatively flat and drained by eighteen major rivers and numerous perennial streams. The coastal terrain is characterized by mangrove forests, lagoons, and estuaries, transitioning inland into tropical pine savannah and broadleaf forests. The highlands remain sparsely populated, whereas the more fertile lowlands have supported extensive agriculture and human settlement (CZMIA 2025).

Climate

3. Belize experiences only two main seasons: a wet (rainy) season and a dry season. The wet season spans from June to November and coincides with the Atlantic hurricane season. Around 60% of the country's annual rainfall occurs during this period. Rainfall is highest in southern Belize, where the tropical climate brings up to 3,800 mm (150 inches) of rain annually. As you move north, precipitation gradually decreases, with the more subtropical regions averaging around 1,500 mm (60 inches) per year. Between November and

February, a transitional period marked by declining rainfall occurs. During this time, cold fronts pass through the country, ushering in the dry season, which lasts until April. Average maximum temperatures across Belize are around 85°F (29.5°C), with minimum temperatures in the low 70s°F (about 20°C). Inland areas experience greater temperature variation, while coastal regions remain cooler due to sea breezes. In mountainous regions, temperatures drop by about 5°F (-15°C) for every 1,000 feet of elevation. Humidity remains high throughout the year, averaging around 80%, but tends to be lower during the dry season. Due to its location along the Caribbean Sea, part of the Atlantic Basin, Belize is particularly vulnerable to tropical cyclones (NCCO 2022).

Human Settlements

Belize has six administrative districts with approximately 225 settlements, which include 9 urban centres, 190 villages, and about 26 communities or settlements. The urban centres consist of two cities, Belize City, the commercial capital, and Belmopan, the administrative capital, as well as seven municipal towns: San Pedro, Corozal Town, Orange Walk Town, San Ignacio and Santa Elena, Benque Viejo del Carmen, Dangriga, and Punta Gorda. Five of these urban centres, Belize City, Corozal Town, Dangriga, Punta Gorda, and San Pedro, are coastal settlements, while the other four, Belmopan, San Ignacio and Santa Elena, Benque Viejo del Carmen, and Orange Walk Town, are inland but located along rivers on flood plains. Additionally, more than 30 villages and communities or settlements are also located on or very near the coast. Belize's population has been growing rapidly (SIB 2022).

Table 1: The six administrative districts of Belize

Administrative Districts	Descriptions
Corozal	Corozal is the northernmost district of Belize, bordered to the north by the Rio Hondo River, which separates it from the Mexican state of Quintana Roo and forms the country's northern international boundary. The district features a long, low-lying coastline, along which many of its key settlements are located. Chief among them is Corozal Town, situated on Corozal Bay. As the district's primary urban centre, Corozal Town hosts most administrative offices, business services, and amenities. Corozal District comprises 27 villages, 9 of which are located on or near the coast. Several of these villages are adjacent to Corozal Town and are increasingly accommodating peri-urban growth and development.
Orange Walk District	The Orange Walk District is located in the northern region of Belize, bordering Mexico to the north and Guatemala to the west. It is a landlocked district with no coastline. Orange Walk Town, situated on the western banks of the New River, serves as the administrative and commercial ~~center~~centre of the district. The district comprises 24 officially recognized villages. Among them, Trial Farm is the largest—both in the district and one of the largest in the country. Located directly north of Orange Walk Town, Trial Farm is experiencing peri-urban expansion due to its proximity to urban amenities. Other major villages in the district include Shipyard, Guinea Grass, and San Jose.
Belize District	The Belize District, located in the central-eastern region of the country and~~,~~ includes ~~several populated~~ offshore islands. It has ~~is home to~~ two major urban centres~~:~~. ~~-~~ Belize City, the former capital, is the oldest, largest, most populous, and economically most significant urban centre in the country is located~~. Positioned~~ on a low-lying peninsula~~ near the midpoint of Belize's coastline, the city is interlaced with the Haulover Creek, streams, man-made canals, and mangrove wetlands. As a port city and Belize's primate city, Belize City has~~ with a population roughly three times larger than that of the second-largest urban centre of San Ignacio town.~~ -~~ San Pedro,~~ the second key urban centre in the district,~~ is located on Ambergris Caye~~. Originally situated at the southern tip of the island, its municipal boundary was~~ recently expanded ~~in April 2025~~ to cover 34,378.43 acres—encompassing most of the island~~. Statutory Instrument No. 59 of 2025: Town Boundaries Order, 2025. San Pedro~~ It is one of the fastest-growing municipalities in the country and serves as the hub of Belize's tourism industry. The Belize District includes 34 villages, ~~two of which,~~including Caye Caulker (a

	major tourist destination) and St. George's Caye (, are located on offshore islands. Caye Caulker has experienced significant growth due to its appeal as a coastal and marine tourism destination. St. George's Caye holds (historically importance significantly as the site of the country's first settlement and former capital. Coastal villages like Five other villages in the district are situated on or near the coast. Among them are Ladyville, the largest village in the country, and Lord's Bank, also among the largest. Located just a few miles outside Belize City, these villages are absorbing much of the peri-urban expansion due to . This trend is driven by a lack of developable land within the city and by socio-economic factors, such as crime, which are prompting residents to relocate while remaining close to jobs, recreation, and other urban amenities.
Cayo District	The Cayo District is the largest district in Belize, situated in the western region of the country and bordering Guatemala's Petén Department. It is landlocked, with no coastline. It contains tThree of Belize's key urban centres: are located within the district. Belmopan, the national capital city, is strategically positioned near the centrally locatede of the country, in the northeastern part of Cayo District. It lies south of the Belize River, nestled between Roaring Creek to the west and Mount Pleasant Creek to the east. And . Eestablished and master-planned in 1970., Belmopan was built in response to the severe destruction caused by Hurricane Hattie in 1961., which devastated Belize City. As the administrative heart of Belize, hub it Belmopan hosts the National Assembly building, the Office of the Prime Minister, most government headquarters, numerous embassies, and the main campus of the University of Belize. Since its iIncorporatedion as a city in 2000, Belmopan has experienced significant growth, becoming the country's it is now the second most populous urban areacentre. San Ignacio and Santa Elena: are tTwin towns located near the western edge of the district. Is divided by Tthe Macal River, runs between them, with San Ignacio on the west bank and Santa Elena on the east. To the north, San Ignacio is bordered by the Mopan River, and the confluence of the Macal and Mopan Rivers forms the Belize River, which borders Santa Elena to the north. They form the inland tourism hub and Despite their inland location, these twin towns are often severely impacted by flooding due to heavy rainfall from tropical systems. Together, they form the hub of Belize's inland tourism industry, serving as the gateway to major archaeological sites, natural reserves, parks, and national monuments within the district. Benque Viejo del Carmen: is the wWesternmost urban centre in both the Cayo District and Belize. This border town sits along the southern edge of the Mopan River and provides access to Belize's main terrestrial border crossing with Guatemala. Within tThe district, there arealso has 34 villages, many of which are locatedmostly along the east-west corridor of the George Price Highway corridor between Belmopan and the twin towns, of San Ignacio and Santa Elena.
Stann Creek istrictdistrict	The Stann Creek District is located in the southern region of Belize and features an extensive coastline along with several offshore islands (, although none of these islands are inhabited). Dangriga, the district's capital and largest town in southern Belize, is situated on the coast at the mouth of the Stann Creek River. It serves as the main financial and commercial centre hubof the district, offering a wide range of services including banking, shopping, administrative offices, and medical care (, most notably through the Southern Regional Hospital), which also serves the Toledo District. Dangriga is also an important hub for and education, in the region. The district is home to has 23 villages, approximately 10 of which are located on or near the coast. Independence is the largest village, with its growth closely tied to the Big Creek port and its proximity to the Placencia Peninsula. The Placencia Peninsula itself is a major focal point for coastal tourism in Stann Creek, hosting two key villages: Placencia at the southern tip and Seine Bight just north of it. Another notable coastal community is Hopkins village, which is experiencing

	significant growth and development pressures due to the expanding coastal tourism industry.
Toledo District	The Toledo District is the southernmost district in Belize, bordered by Guatemala to the west and south, and the Caribbean Sea to the east. Punta Gorda, located along the southeastern coast of the district, remains a vital commercial hub despite the 2022 Housing and Population Census revealing it is no longer the most populous settlement in Toledo. ~~The town continues to attract thousands of residents from rural areas throughout the district who come daily for business and trade.~~ Toledo is home to 48 villages, six of which are coastal. Notably, 41 of these villages are indigenous Maya communities that hold communal land rights. Bella Vista, situated along the Southern Highway near the border with Stann Creek District, is now the largest village in Toledo, with a population that has surpassed that of Punta Gorda.

Source: (SIB 2022), (Elections and Boundaries Department 2025)

Population Trends and Patterns

4. Belize's population has ~~been~~ grown~~ing~~ significantly ~~. rapidly. O~~over the last 60 years, ~~there has been a~~increasing fourfold~~. increase in the population with g~~Growth rates were high ~~(ranging between~~ 2.5 – 3.8% per annum~~)~~ during ~~in the~~ 1980s, ~~1990's and~~ to early 2000~~'~~s. According to the 2022 Housing and Population Census, the population ~~of Belize~~ is 397,483~~:~~ growing by 23.3% since t~~he last census in~~ 2010 (SIB 2022). ~~This represents a~~ reflecting a slower annual ~~population~~ growth rate of 1.9% ~~per annum between~~ 2010 and 2022. ~~The figures indicate that the population growth rate per annum has decreased during this most recent intercensal period.~~

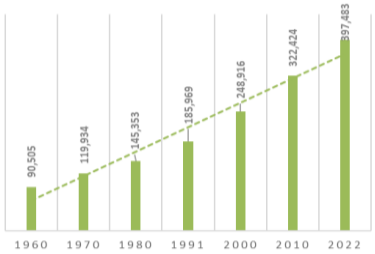


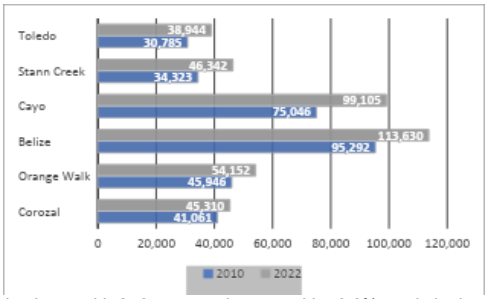
Figure 2: Population Growth in Belize 1960-2022
Source: (SIB 2022)

5. Data from (SIB) 2022 ~~also~~ shows that over half of Belize's population (53.5%) is concentrated in the central region, particularly in the Belize and Cayo districts, which account for 28.6% and 24.9% of the total population, respectively. The northern districts—Orange Walk (13.6%) and Corozal (11.4%)—together make up 25% of the population, while the southern districts account for 21.5%, with Stann Creek comprising 12.1% and Toledo 9.3%, the lowest of all districts. Notably, the fastest-growing district between 2010 and 2022 was Stann Creek, which experienced a 35% increase in population. Cayo followed closely with 32% growth, and Toledo saw a 27% rise. In contrast, growth was more modest in the Belize District (19%), Orange Walk (18%), and Corozal (10%). These population trends highlight a growing and uneven demand for housing across the country, particularly in rapidly expanding districts like Stann Creek and Cayo. This underscores the urgent need for climate-resilient housing solutions, especially in areas vulnerable to climate impacts such as coastal flooding, and hurricanes. As population pressures increase, sustainable urban planning and resilient infrastructure will be essential to ensure safe, secure, and adaptive living conditions for current and future residents.

Figure 3: Population Growth by District 2010 and 2022
Source: (SIB 2022)

Household and Housing Characteristics

6. According to the SIB (2022), Belize's population grew by 23.3% during the intercensal period; however, the number of households increased by an even greater margin—rising by 39%, from 79,658 in 2010 to 110,719 in 2022. This significant growth in households is largely attributed to a decline in average household size, which dropped from 4.0 persons in 2010 to 3.6 in 2022. The Toledo District had the highest average household size at 4.0, while the Belize District had the lowest at 3.2. The most notable growth was seen in



smaller households: those with 2–3 persons increased by 6.6%, and single-person households rose slightly by 0.3%. In contrast, households with 4–6 persons declined by 1.7%, and those with 7 or more persons decreased by 5.2%. Nationally, the percentage of overcrowded households declined by 6.3%, from 14.3% in 2010 to 8% in 2022. Despite this progress, the Toledo District still had the highest rate of overcrowding at 22%, although this marked a 15.2% decrease since 2010.

7. ~~These s~~Shifts in household structure have direct implications ~~for vulnerability~~ to storms and hurricanes vulnerability. Smaller households, especially single-person and elderly-headed ~~ones~~, ~~may~~ face greater challenges in ~~storm~~ preparedness, evacuation, and recovery due to limited support ~~networks~~. On the other hand, overcrowded households, particularly in rural and economically disadvantaged areas like Toledo, are more likely to reside in substandard housing that is less resilient to extreme weather events thus increasing risk. The data also highlights a demographic shift in household leadership: while the majority of households (66.5%) are still headed by men, this represents a 5.8% decrease since 2010. Female-headed households now account for 33.5% of all households, an increase of the same magnitude. This change is noteworthy, as female-headed households, especially those led by single mothers, may also face unique socioeconomic vulnerabilities in the face of natural disasters. This is further highlighted by UNWOMEN (2022) Policy Brief "Gender Inequality of Climate Change and Disaster Risk in Belize", which explains that following hurricanes and storms, although all suffer from property damages, women suffer the most due to their limited access to resources for hazard-proofing their properties.

Conditions and Quality of Housing

8. The findings of the 2022 Housing and Population Census underscore the urgent need for investments in more resilient housing, especially in the face of increasing threats from storms and hurricanes. Despite ~~While over half (~~53.9%~~)~~ of homes ~~in Belize~~ are constructed with concrete walls, 30.3% are still built with wood and another 7.8% with highly vulnerable materials such as sheet metal, plywood, and traditional materials like sticks and palmetto. Roofing ~~materials present even greater~~ is a major concern: a staggering 82.9% of homes rely on sheet metal or zinc roofing, which is particularly susceptible to wind damage during hurricanes, while only 12.7% have more resilient concrete roofs. The census also revealed that 30.5% of the housing stock requires minor ~~repairs,~~repairs: 8.4% need moderate repairs, and 7.0% major repairs highlighting the structural fragility is weak~~of much of the current stock~~. Alarmingly, 27%~~even relatively new~~ of homes built between 2010 and 2019 ~~account for 27% of those needing repairs, with~~and 6% built ~~of homes built~~ as recently as 2020–2022 already require repairs, also showing signs of structural issues (SIB 2022). This raises serious concerns about the ~~quality of~~ construction quality and ~~the~~ enforcement of building standards.

9. Furthermore, ~~the data show that~~ homes most in need of repair are predominantly concrete (46.7%) and wooden (34.3%), ~~which could point to~~suggesting issues with poor design ~~or~~and construction ~~execution~~, rather than ~~not just~~ material alone ~~choice~~. In Belize City, where the housing stock is significantly older than in other parts of the country, is especially vulnerable ~~vulnerability~~ to severe weather events ~~is even more pronounced~~. These ~~statistics~~ findings ~~collectively point to~~ highlight an urgent need for targeted investment in upgrading and reinforcing existing homes, ~~improving~~ enforcing construction standards for new builds, and promoting the use of more durable materials~~, particularly in vulnerable areas.~~ With the increasing frequency

and severity of hurricanes, ~~enhancing the~~ strengthening housing resilience ~~of Belize's housing sector is not just a matter of infrastructure, it is a matter of~~ is critical for national safety and long-term economic stability.

Impacts of Climate Variability and Change

10. ~~In Belize, C~~climate change is ~~has~~ intensifying ~~intensified~~ hydro-meteorological hazards in Belize, ~~increasing both the immediate and medium-term~~leading to greater vulnerability and significant climate variability~~of the population~~. ~~These changes are accompanied by significant inter- and intra-annual climate variability.~~ As a result, the country is experiencing more frequent and intense meteorological droughts, floods, storms, and hurricanes particulary impacting. ~~These climate-related hazards continue to impact~~ low-lying coastal plains and densely populated urban areas., ~~causing~~These events cause widespread ~~damage to~~ property damage, loss of ~~lives~~life, and serious disruptions to livelihoods (NCCO 2021). For ~~the purposes of~~ this project, the sections below describe the climate variables ~~that are either associated with or influenced by the~~ linked to ~~development of~~ storm~~s~~ and hurricane~~s~~ development.

Factors that contribute to Hurricane Development.

11. ~~Analyzing the frequency and intensity of hurricanes is essential to~~ uUnderstanding hurricane frequency and intensity is key to assessing climate change impacts. ~~how climate change trends are influencing storm behavior over time.~~ ~~The formation and intensification of h~~Hurricanes form when ~~rely on~~ four ~~primary ingredients~~conditions align: warm ocean waters (at least 26.5°C), a pre-existing weather disturbance such as a tropical wave, low vertical wind shear, and active thunderstorm development.
12. Hurricanes are categorized using the Saffir–Simpson Hurricane Wind Scale with 1 (least severe, exceeding 74 mph winds) to 5 (most severe, exceeding 157 mph winds) rating based on the hurricane's maximum sustained wind speed (Taylor 2010). ~~(~~NOAA~~)~~ (2025) considers Category 3 hurricanes (111 mph to 129 mph) or higher to be major hurricanes ~~because of their~~ due to ~~potential for~~ catastrophic damage potential ~~wind damage and significant loss of life due to the strength of their winds.~~ These powerful systems redistribute heat from the tropics to higher latitudes, playing a key role in regulating the Earth's energy balance. Their formation typically begins with a tropical wave—an area of low pressure moving through a warm, moisture-rich atmosphere—usually during the Atlantic hurricane season from June to November. As warm, moist air rises over heated ocean waters, it cools and condenses to form water droplets. This process releases latent heat, which intensifies cloud and thunderstorm development. Continued rising of warm air can lead to a closed, rotating low-level circulation—eventually forming a tropical cyclone or hurricane (Méndez-Tejeda 2023).

Analysis of Frequency and Intensity of Hurricanes for Belize.

13. Figure 4 illustrates Belize's maximum and average air temperatures from 1971 to 2025 based on data provided by the National Meteorological Service (NMS) of Belize to the Caribbean Institute of Meteorology and Hydrology (CIMH) for two locations, the Airport (central coastal) and Central Farm (central inland) stations.

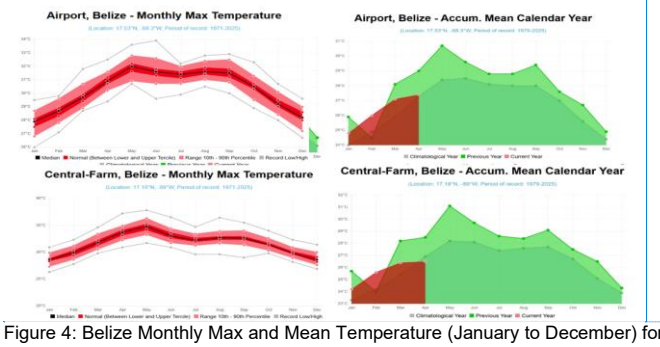


Figure 4: Belize Monthly Max and Mean Temperature (January to December) for 1971-2025
Source: (CIMH 2025)

14. Since the early 1900s, Belize has experienced rising air temperatures alongside increasing carbon dioxide emissions. In 2024, the globally averaged near-surface temperature was 1.55 °C ± 0.13 °C above the 1850–

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1900 average, which is commonly used to represent pre-industrial conditions. Notably, 2024 was the warmest year on record in the 175-year history of observed surface temperature data. According to (WMO) 2024, each year from 2015 to 2024 ranks among the ten warmest on record.

15. Belize has not been exempted from these global trends. As illustrated in Figure 1, 2024 was also the warmest year on record for the country, with a national average temperature anomaly of 0.8 °C. Temperature records show that 2024 mean temperatures exceeded the climatological average for the 1991–2020 reference period. At the airport station, the record high occurred in June with a maximum of 34 °C, while at Central Farm, the highest temperature recorded was 38 °C in May. The interannual temperature range at these two locations typically falls between 26 °C and 38 °C, highlighting the extent of warming in 2024.

Tropical Cyclones in the North Atlantic Ocean Basin

16. Data from 1860 showed that the North Atlantic Ocean Basin has been highly active in tropical cyclone development, with a total of 1,988 systems recorded in the region. As illustrated in Figure 5, there is a noticeable increasing trend in tropical cyclone activity after 1950 compared to earlier decades. Of the 1,988 systems, the most recent was Tropical Storm Sara, which made landfall in Belize in November 2024. Prior to the 1950s, the highest number of storms recorded in a single year was 20. In contrast, the maximum number of systems observed in one year—31—occurred in 1961, 2000, and again in 2020. Notably, only one tropical cyclone developed in the entire basin in 1914, highlighting the variability in storm activity over time (NOAA 2025).

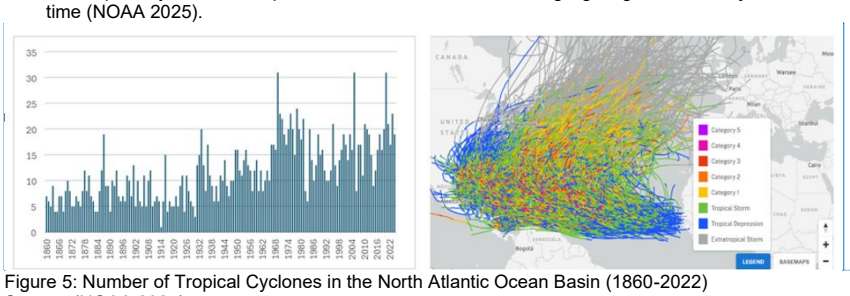

Figure 5: Number of Tropical Cyclones in the North Atlantic Ocean Basin (1860-2022)
Source: (NOAA 2025)

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17. Hurricane Intensity and development ~~is~~are also dependent on the accumulated cyclone energy (ACE) index created by William Gray and associates at Colorado State University (Niño 2021). It considers the number, duration, and strength of all tropical storms and hurricanes in ~~ocean~~the ocean basin during the year. Figure 5 depicts the ACE index for the North Atlantic Ocean, and it is used to compare the overall activity of tropical cyclones utilizing tropical storms and hurricanes only and classify the hurricane season as either extremely active, above-normal, near-normal, and below-normal.

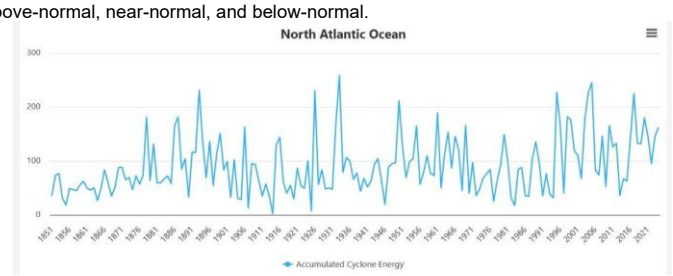


Figure 6: Trends in the ACE Index for the North Atlantic Ocean Basin since 1850.
Source: (NOAA 2025)

18. As shown in Figure 6, the Accumulated Cyclone Energy (ACE) index for the North Atlantic Basin reveals a recurring pattern of heightened activity, with notable spikes in the years 1893, 1926, 1933, and 1950, and again in more recent years such as 1995, 2004, 2005, and 2017. These peaks reflect periods of intensified tropical cyclone activity. While the ACE index demonstrates variability across the past two centuries, there

has been no consistent long-term increase in total hurricane activity, even in the face of rising global temperatures during the 20th and 21st centuries. This underscores the complex relationship between climate variability and tropical cyclone dynamics.

19. Climate variability—driven by factors such as the Atlantic Multidecadal Oscillation (AMO), El Niño-Southern Oscillation (ENSO), and other ocean-atmosphere interactions—plays a key role in modulating storm frequency and intensity (Chen 2025). The unpredictability introduced by these natural climate patterns, especially when layered over the long-term warming trend, presents a significant risk for countries like Belize. The irregular yet potentially extreme nature of tropical cyclone activity increases challenges in disaster preparedness and resource planning, heightening the vulnerability of coastal communities.

Hurricanes Making landfall in Belize

20. Figure 7 illustrates trends in the frequency (number of aggregate and major hurricanes) of landfalling hurricanes in Belize since 1850.

Figure 7: Hurricanes Making Landfall in Belize.
Source: (NOAA 2025)

21. Table 2 illustrates trends in the intensity (presented in terms of central pressure and maximum wind speed) of landfalling major hurricanes in Belize since 1850.

Table 2: the intensity (presented in terms of central pressure and maximum wind speed) of landfalling major hurricanes in Belize since 1850

STORM NAME	DATE RANGE	MAX WIND SPEED	MIN PRESSURE	MAX CATEGORY
IRIS 2001	Oct 04, 2001 to Oct 09, 2001	125	948	H4
KEITH 2000	Sep 28, 2000 to Oct 06, 2000	120	939	H4
GRETA 1978	Sep 13, 1978 to Sep 20, 1978	115	947	H4
HATTIE 1961	Oct 26, 1961 to Nov 01, 1961	145	914	H5
UNNAMED 1931	Sep 06, 1931 to Sep 13, 1931	115	-1	H4

Source: (NOAA 2025)

22. Prior to the 20th century, Belize experienced an average of one hurricane per decade, typically balanced between Category 1 and Category 2 storms. Notably, there were no recorded hurricanes exceeding Category 3 intensity (111–129 mph), indicating that major hurricanes were exceptionally rare during this period. This historical pattern suggests a relatively low frequency and intensity of landfalling tropical cyclones in the region during the pre-industrial era.
23. Figure 7 illustrates that, throughout the 20th century, there is no clear overall trend in the frequency of landfalling hurricanes in Belize, even as global temperatures began to rise. Certain decades saw no landfalling hurricanes. On average, hurricanes made landfall only once per year, with the notable exception of 1961, when both Hurricane Anna (Category 2) and the devastating Hurricane Hattie (Category 5) struck the country in July and October, respectively.
24. However, since the 1950s, the number of hurricanes making landfall in Belize has slightly increased. From 1850 to 1949, only 10 hurricanes made landfall, compared to 13 between 1950 and 2024. A total of five major hurricanes (Category 3 or higher) have historically made landfall, with two of them—Keith (2000) and Iris (2001)—occurring in close succession after the turn of the century.
25. While major hurricanes remain relatively infrequent in Belize, the risk is increasing. According to (IPCC) 2023, the global proportion of major hurricanes (Category 3–5) has increased over the past four decades.

Additionally, climate change has contributed to stronger rainfall associated with tropical cyclones and has negatively impacted economic growth, infrastructure, and livelihoods, particularly in vulnerable coastal regions. In Belize, this raises concerns about the resilience of infrastructure, especially given outdated building codes, limited risk transfer mechanisms, and high exposure in coastal zones.

26. Tropical storms, rather than hurricanes, have historically posed the most frequent threat to Belize. Since 1890, a total of 33 tropical storms has made landfall, as shown in Figure 8. Of these, 16 occurred before 1950 and 17 afterward (NOAA 2025). Although the overall number is similar, the past two decades have seen a notable increase in the frequency of landfalling tropical storms, along with a shorter return period. In five separate years, Belize was impacted by two tropical storms in the same season. This pattern mirrors broader trends in the North Atlantic Basin, where tropical storm activity has increased significantly since the 1950s. Most systems maintained tropical storm strength upon landfall, though some weakened rapidly to tropical depressions.

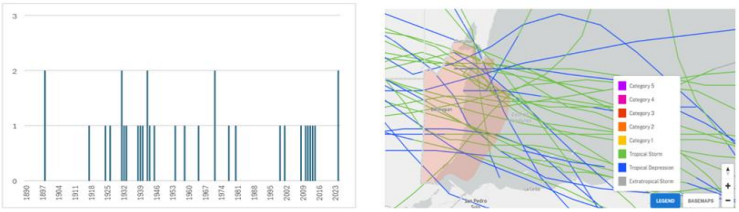


Figure 8: Tropical Storms Making Landfall Belize
Source: (NOAA 2025).

27. Given that tropical cyclones remain the most impactful climate hazard for Belize, their interaction with factors such as poor infrastructure, outdated regulations, and socio-economic vulnerability increases the potential for catastrophic outcomes. While there is still scientific uncertainty regarding how global warming will influence hurricane frequency and intensity worldwide, it is highly likely that the occurrence of major hurricanes (Category 3 or higher) will increase, intensifying the risks for small coastal nations like Belize.
28. In Belize, the impacts of changing storm behavior are of growing concern. Climate change is driving rising sea surface temperatures and shifting atmospheric conditions, contributing to the increased frequency, intensity, and unpredictability of tropical storms and hurricanes. This creates escalating risks to life, property, and infrastructure, especially in vulnerable coastal communities and low-lying urban ~~center~~centres.

Financial Impact of Losses and Damages

29. As described above, the housing sector along Belize's coastal belt is a mix of formal and informal structures, many built with lightweight materials and lacking proper engineering to withstand hurricane-force winds and flooding. Belize City, the country's most densely populated urban area, is especially vulnerable due to its low elevation and concentration of residents. Hurricane Lisa, which made landfall near Belize City in 2022 as a Category 1 storm, demonstrated the sector's vulnerability. Despite its relatively moderate strength, Lisa caused widespread destruction through storm surge, strong winds, and flooding. According to the (UNDP 2023), the housing sector alone sustained BZ$54.4 million in direct damage and an additional BZ$3.5 million in related losses. Belize City accounted for 76% of the damage, with a further 21% occurring in Belize Rural areas. The hurricane affected over 4,483 households and displaced nearly 15,000 people. Belize's vulnerability to storms is long-standing and well-documented. Over the past 15 years, the country has been repeatedly impacted by high-intensity weather events:
    - Hurricane Earl (2016): Made landfall as a Category 1 hurricane, damaging over 2,000 homes and causing economic losses exceeding BZ$100 million. Belize City and the Belize River Valley were among the most affected areas.
    - Tropical Depression 16 (2008): Caused catastrophic flooding in southern Belize, damaging more than 1,500 homes and displacing thousands, particularly in the Toledo and Stann Creek districts. The Policy Brief on the gendered impacts of climate change posited that Women suffer the most from events such as these, due to poor housing and insufficient resources to build forward better (Fruttero 2024).
    - Cumulative Impact: According to NOAA and IFRC data, Belize has suffered storm-related damage nearly every year since 2008, with repeated impacts on housing, infrastructure, and livelihoods.

Financial Loss and damage associated with storms and hurricanes will be elaborated during the development

of the full funding proposal.

30. The vulnerability of homes and households is particularly critical. As climate-related hazards become more frequent and severe, residential structures are increasingly exposed to high winds, intense rainfall, and storm surge. These impacts not only damage or destroy homes, but also deepen existing social and economic vulnerabilities, leaving families displaced, traumatized, and without access to basic services. Housing loss disrupts livelihoods, education, and social cohesion, while damage to surrounding infrastructure such as roads, schools, and health facilities further limits emergency response capacity, healthcare, and access to food and water, often compounding the devastation. Despite increasing risks, many households in Belize are compelled to build in high-risk areas due to the scarcity and high cost of safe, developable land. As of September 2024, approximately 89,874 people across 20,562 households were living in multidimensional poverty, representing over 22.1% of the population (Figure 9) (SIB 2024). Consequently, a large number of homes are self-built using substandard materials and often do not comply with building codes.

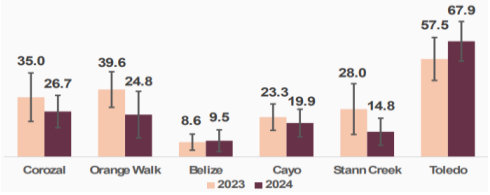


Figure 9: Incidence of Multidimensional Poverty by District, September 2023 and 2024
Source: (SIB, Multidimensional Poverty Study 2024)

31. Adding to the challenge is the lack of access to affordable finance for resilient housing. The high upfront cost of climate-resilient construction, combined with limited access to credit, insurance, or subsidized financing options, makes it extremely difficult for vulnerable families to invest in safer homes. As a result, many remain trapped in a cycle of risk and recovery, unable to rebuild adequately after each event, with repeated shocks further eroding their coping capacity and delaying long-term recovery. To break this cycle, reducing disaster risk must prioritize resilient housing, inclusive land-use planning, and community-based preparedness. Future development must integrate climate change projections and ecosystem considerations, ensuring that construction and infrastructure decisions are (SIB 2024) informed by environmental risk. At the same time, expanding access to affordable, gender inclusive finance and technical support is essential to enable low-income households to build safe, durable homes that can withstand future climate shocks. Without these targeted efforts, the risks to homes, livelihoods, and national development will only continue to grow.

Climate Change Projections

32. Understanding the evolving dynamics of storm systems under climate change is crucial for enhancing national preparedness, reinforcing infrastructure resilience. As the climate continues to warm, the frequency, intensity, and behavior of storms and hurricanes are projected to change, posing heightened risks to vulnerable regions. The sections below present an analysis of downscaled climate model projections for Belize, with a focus on key climate variables that influence storm formation and hurricane severity: rainfall patterns, sea level rise, sea surface temperatures, air surface temperatures, and hurricane activity. This analysis provides critical insights into how future climatic shifts may shape the risk landscape for extreme weather events in Belize.
33. The Government of Belize, through the National Climate Change Office, supported the development of a Climate Change Model as part of its efforts to inform the development of the National Climate Change Policy and Master Plan in 2021. This strategic initiative aimed to strengthen the country's capacity to anticipate and respond to the long-term impacts of climate change. This section outlines the results from Model developed for Belize, covering a 100-year projection period from 2021 to 2121. Climate projections were generated for the base year (2021) and at future intervals of 25, 50, 75, and 100 years—namely 2046, 2071, 2096, and 2121. Also, since its Fourth Assessment Report (AR4), the IPCC introduced four Representative Concentration Pathways (RCPs), which project how GHG concentrations may evolve due to human influence through to the year 2100. The four RCPs—RCP2.6, RCP4.5, RCP6.0, and RCP8.5—are named according to their estimated radiative forcing values (in watts per square meter) by 2100, relative to pre-industrial levels. RCP2.6 represents the most ambitious mitigation scenario, while RCP8.5 reflects the most extreme emissions trajectory. These RCPs were used as the foundation for the climate projections presented here, allowing for analysis of Belize's future climate under a range of internationally recognized emissions

pathways (NCCO 2021).

Climate Model Outputs:

Rainfall

34. The annual rainfall trend prediction was derived using a regression analysis between the year and the predicted urban surface values. These values were extracted by modeling the urban surface on a per-pixel basis. A pixel size of 6 × 6 km was chosen, as it provided the strongest correlation between urbanization and rainfall patterns. To model rainfall in non-urban areas, a grid of 21 × 21 km was used. This larger grid size produced correlation results comparable to those from the 6 × 6 km model, while being large enough to minimize the influence of urbanization. Within this grid, data between nearby locations were interpolated using a scalar field gradient, ensuring smooth transitions between measured values.
35. Seasonal rainfall differences were incorporated into the CCM (Climate Change Model) by analyzing variations between wet and dry seasons. A threshold of 100 mm/month was used to define the seasonal boundary, following research on the narrowing gap between wet and dry season precipitation and its effects on vegetation productivity. For Belize, the wet season was defined as June through November, and the dry season as December through May. To assess changes over time, annual rainfall anomalies were calculated by summing values across all sampled locations (Table 2). These anomalies serve as indicators for evaluating future seasonal shifts due to climate change.

Key Findings include:

- Overall Decline in Rainfall: A general decrease in mean annual rainfall is expected across Belize, with a slight increase projected near the mountainous southern regions.
- Expansion of Dry Zones: Dry areas are predicted to expand, while rainfall will increasingly concentrate in mountainous regions.
- Urbanization Impact: Increased urban development will lead to decreased rainfall, as forested areas—critical for water vapor retention and cloud formation—are replaced by urban and agricultural land, reducing the likelihood of precipitation.
- Dry Season Stability: Rainfall quantities and frequency during the dry season are not expected to change significantly.
- Wet Season Intensity: While the number of rainy days in the wet season will decline, rainfall events will become more intense, resulting in a higher frequency of torrential downpours.

Table 2: Rainfall Predictions Over the Next Century in Belize (mm)

Time frame	Value	Current (2021)	25 Years	50 Years	75 Years	100 Years
Wet Season	Max	290.2	269.8	249.4	229.1	219.9
	Min	49.3	16.1	0.0	0.0	0.0
Dry Season	Max	167.6	156.9	153.4	153.6	153.8
	Min	0.0	0.0	0.0	0.0	0.0
Annual Total	Mean	107.4	89.9	74.7	61.8	50.5

Source: (NCCO 2021)

36. The projected changes in rainfall patterns across Belize over the next century have significant implications for flood risk, particularly in relation to storms and hurricanes. Although overall annual rainfall is expected to decline, the concentration of rainfall in mountainous regions, combined with more intense precipitation events during the wet season, raises concerns about localized flooding. The increased intensity of rainstorms means that when storms and hurricanes do occur, they are more likely to produce sudden, heavy downpours that can overwhelm drainage systems and riverbanks, leading to flash floods and landslides, especially in vulnerable mountainous and urbanized areas. Furthermore, the expansion of dry zones may reduce soil moisture retention, making these areas more susceptible to rapid runoff during intense storms, exacerbating flood risks downstream. Urban expansion, which reduces forest cover, further compounds the problem by

diminishing the natural capacity of landscapes to absorb and regulate water flow, increasing surface runoff and flood potential. Although the frequency of rainy days in the wet season may decrease, the higher intensity of rainfall events implies that flood risks during storms and hurricanes could increase, demanding improved flood management strategies and resilient infrastructure to protect communities across Belize.

Sea Level Rise

37. To observe the sea level rise affecting Belize, the nearest points to the coastline had to be studied. The metadata used was defined by a grid, marked with minimum and maximum latitude and longitude. This allowed the determination of whether the grid intersected with land, and the measurements were saved accordingly. A total of five points along the coastline had been identified where daily measurements were recorded from 1993 to 2020.

Key Findings include:

- The actual mean sea level (MSL) increase rate observed—3.7 mm/year—has been found to fit perfectly with the observations and predictions of the IPCC, aligning closely with Scenario RCP2.6.
- The physical model concluded that the rise in sea level had recently accelerated, consistent with the IPCC's high-confidence suggestions.
- Around the year 2080, the RCP models could be clearly distinguished, and beyond that point, the sea level rise under the worst-case scenarios was projected to increase much more rapidly than under other RCP models.

38. The sea level rise in Belize had been modeled according to the RCP2.6, RCP4.5, and RCP6.0 scenarios, with results over the next 100 years shown in the table 3.

Table 3: Sea Level Rise Predictions over the next Century in Belize

Model	Current (2021)	25 Years	50 Years	75 Years	100 Years
RCP2.6	Set level 0	+ 9.13 cm	+16.40 cm	+ 25.70 cm	+ 35.00 cm
RCP4.5	Set level 0	+ 9.14 cm	+ 20.40 cm	+ 45.10 cm	+ 91.30 cm
RCP6.0	Set level 0	+ 9.14 cm	+ 21.50 cm	+ 49.50 cm	+ 103.90 cm

Source: (NCCO 2021)

39. The observed mean sea level rise of 3.7 mm per year, which closely aligns with the IPCC projections under Scenario RCP2.6, indicates a steady upward shift in baseline sea levels along the Belizean coast. This rise means that during hurricanes and tropical storms, the starting water level for storm surges will be higher than before. As a result, even storms of moderate strength could cause more extensive coastal flooding, putting communities and infrastructure at greater risk.
40. Furthermore, the recent acceleration in sea level rise identified by the physical model and supported by IPCC assessments with high confidence suggests that this threat is intensifying. As sea levels rise faster, storm surges during hurricanes will become more severe, leading to increased flooding, stronger wave action, and more significant erosion of natural coastal defenses such as mangroves and coral reefs. These changes can exacerbate the damage caused by storms, making coastal areas more vulnerable.
41. Looking ahead to around 2080, the differences between the RCP scenarios become more distinct. The worst-case scenarios predict a much more rapid rise in sea levels, which could significantly amplify the destructive potential of hurricanes and tropical storms. Under these conditions, coastal flooding and damage could become much more frequent and severe, making it essential for Belize to implement stronger adaptation measures. This includes reinforcing coastal defenses, improving evacuation infrastructure, and adopting land-use policies that reduce vulnerability to storm impacts.

Sea Surface Temperature

42. The C3S Sea Surface Temperature dataset provides daily data from 1982 to 2020, encompassing 1,270 data points that extend from the coastline to the longitude 87.216442°W, corresponding to a spatial resolution of 4x4 km grids. Sea surface temperature predictions were performed on a point-by-point basis. Initially, a polynomial model capturing the monthly variations was developed as an additive composition, which plots the number of data points deviating from the mean trend each month. This model effectively reproduces the monthly temperature patterns (see Figure 15), illustrating the annual upward trend in sea surface temperature.

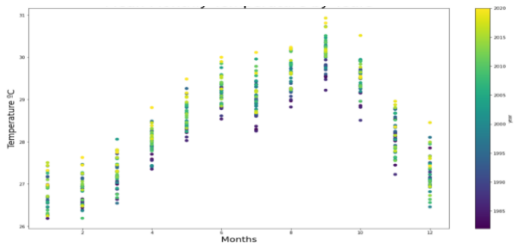


Figure 10: Value of the Sea Surface Temperature per month and year (1982 to 2020).
Source: (NCCO 2021)

43. Table 4 presents the projected sea surface temperatures for coastal regions surrounding Belize over the next 100 years. It details the spatial distribution of mean sea surface temperatures for each quarter at 25-, 50-, 75-, and 100-year intervals.

Table 4: projected sea surface temperatures for coastal regions surrounding Belize

Current (2021)	25 Years	50 Years	75 Years	100 Years
28.19°C	28.67°C	29.20°C	29.58°C	30.06°C

Source: (NCCO 2021)

Key Findings include:

- The mean sea surface temperature is projected to increase by 1ºC within the first 50 years, followed by an additional 0.7ºC rise over the next 50 years. Notably, maximum temperature peaks are expected to persist for longer durations than currently observed.
- Temperature increases will be more pronounced offshore, primarily due to Ekman transport.
- Chetumal Bay will experience the highest temperatures, remaining approximately 2ºC warmer than surrounding waters for periods exceeding four months.
- Significant seasonal variability in the rate of temperature increases and decrease is expected. The underlying causes of these seasonal fluctuations are currently under investigation.

44. The projected rise in sea surface temperatures poses significant implications for the intensity and behavior of storms and hurricanes in the region. An increase of 1ºC in the first 50 years, followed by an additional 0.7ºC in the subsequent 50 years, will likely provide more energy to tropical cyclones, increasing their frequency, strength, and duration. Of particular concern is the persistence of high temperature peaks, which could extend the hurricane season and prolong the conditions necessary for storm formation. Warming is expected to be more pronounced offshore, especially due to Ekman transport, which may contribute to rapid storm intensification before landfall—leaving less time for communities to respond. Chetumal Bay is projected to become a regional hotspot, remaining up to 2ºC warmer than surrounding waters for extended periods. This localized warming could amplify storm surge risks and extreme rainfall events in adjacent coastal areas. Additionally, the seasonally variable rate of temperature increase adds uncertainty to forecasting, complicating efforts to predict storm behavior and increasing the need for adaptive, responsive disaster preparedness strategies.

Surface Air Temperature

45. The mean surface air temperature in Belize is projected to rise over the next 100 years. Under an optimistic scenario (RCP 2.6), the maximum temperature could increase up to 2°C, while the mean temperature may rise by approximately 0.7°C. Regardless of the scenario, extreme temperature events—both unusually high and low—are expected to become more frequent, even as the mean temperature increases.
46. In terms of extremes, under a pessimistic scenario (RCP 4.5), temperature anomalies could reach ±8°C from the mean within the next century. Under the more optimistic RCP 2.6 scenario, the variation is expected to be ±6°C (Table 5). As a result, Belize will likely experience more frequent and intense heatwaves and cold spells, with extreme hot and cold months becoming increasingly common.

Key Findings Include:

• Temperature Rise Expected: Belize's mean surface air temperature will increase over the next 100 years, with up to 0.7°C rise in mean and 2°C in maximum temperatures under the optimistic RCP 2.6 scenario.
• More Extreme Events: Extreme heat and cold events will become more frequent and intense under all climate scenarios.
• Greater Temperature Variability: Temperature extremes could vary by ±6°C (RCP 2.6) to ±8°C (RCP 4.5) from the mean, leading to more recurring heatwaves and cold spells.
• Uneven Geographic Impact: Temperature changes will be uneven across Belize, with cooler southern mountains and hotter conditions shifting depending on the scenario; differences between models will become clear by 2080.

47. These temperature changes will not be evenly distributed across the country. Spatial variations will depend on the emissions scenario considered. Under the optimistic RCP 2.6 model, the southern mountainous regions will remain the coolest areas, while the northwestern part of northern Belize will experience the most intense heat. In contrast, under the pessimistic RCP 4.5 model, the highest temperatures will shift toward the southern and coastal areas. The divergence between these two climate projections will become more evident by around 2080.

Table 5: Mean Air Surface Temperature Projection in Belize

Model	Parameter	Current (2021)	25 Years	50 Years	75 Years	100 Years
RCP2.6	Max	24.68°C	25.16°C	25.16°C	25.83°C	26.42°C
	Min	19.96°C	19.96°C	19.96°C	19.96°C	19.96°C
	Mean	22.92°C	23.17°C	23.20°C	23.40°C	23.61°C
RCP 4.5	Max	24.68°C	25.23°C	26.11°C	29.00°C	32.65°C
	Min	20.15°C	20.15°C	20.15°C	17.71°C	14.11°C
	Mean	22.93°C	23.23°C	23.32°C	23.60°C	23.92°C

Source: (NCCO 2021)

48. Rising surface air temperatures in Belize—projected to increase by up to 2°C in maximum values and 0.7°C in mean values under the optimistic RCP 2.6 scenario—have serious implications for storm and hurricane activity. Warmer air leads to warmer ocean surface temperatures, which fuel tropical storms and hurricanes. As a result, Belize is expected to face more intense and possibly more frequent hurricanes, even under lower-emission scenarios, putting homes and communities at greater risk.
49. The projected increase in extreme temperature events—ranging from ±6°C under RCP 2.6 to ±8°C under RCP 4.5—can further destabilize atmospheric conditions. These fluctuations increase the likelihood of sudden, severe storms. Stronger winds, heavier rainfall, and storm surges can damage or destroy homes, particularly in low-lying coastal and flood-prone areas. Informal settlements and poorly constructed buildings are especially vulnerable, increasing the risk of displacement and long-term economic hardship for affected households.
50. In addition, more frequent heatwaves and cold spells will stress household infrastructure and daily life. High temperatures can degrade roofing materials, strain energy systems (due to increased cooling needs), and compromise indoor comfort and safety—especially for vulnerable populations such as the elderly, young children, and those with pre-existing health conditions. Cold spells, though less common, can also catch households unprepared, leading to discomfort and health risks in poorly insulated homes. The uneven distribution of warming across Belize—hotter conditions in the north and along the coast, cooler zones in southern mountainous areas—may also shift the geographic concentration of storm impacts. Coastal and lowland communities, already at higher risk of hurricanes, may face greater destruction and displacement. By 2080, the differences between climate models will become more pronounced, further highlighting the need for climate-resilient housing, improved building codes, and targeted support for at-risk households.

Inland Flooding

51. Predictions of inland flooding in Belize were based on rainfall, sea surface temperature, and air surface temperature data. The primary assumption is that inland flooding results mainly from heavy rainfall and extreme storms causing rivers to overflow. The model developed for Belize (CCM model) does not consider urban flooding from poor drainage systems due to the complexity of factors involved; it focuses solely on flooding caused by river overflow. Belize's districts are divided into three zones (A, B, and C) based on

geoclimatic conditions affecting flood risk (Table 6):

- Zone A (Cayo, Stann Creek, Toledo): Located on the slopes of the Mayan Mountains, the rainiest region in Belize. This zone experiences high flash flood risk due to heavy rainfall accumulation on steep slopes and proximity to rivers like the Macal and Rio Grande. While some rainfall is absorbed by the soil, extreme rainfall events and river overflows pose a significant flood risk.
- Zone B (Belize District): Characterized by many rivers, including the Belize River and its large tributaries (Macal and Mopan Rivers) that originate from Zone A. During rainy seasons, these rivers carry excess water from Zone A, increasing flooding risk. The low elevation and medium rainfall levels, combined with heavy tropical storms and hurricanes, further contribute to flooding in this zone.
- Zone C (Orange Walk, Corozal): The driest region with only three major rivers (Hondo, Booths, and New River), resulting in lower risk from rainfall or river overflow. However, this zone is highly vulnerable to flooding triggered by hurricanes and extreme weather events.

Table 6: Flood Risk in Belize by Zone and Flood Type

Zone	Districts	River Overflow		Hurricanes		Rainfall	
		Risk	Trend	Risk	Trend	Risk	Trend
Zone A	❖ Cayo ❖ Stann Creek ❖ Toledo	High	↗	Low	→	Medium	↗
Zone B	❖ Belize	High	↗	High	↗	High	↗
Zone C	❖ Orange Walk ❖ Corozal	Low	↘	High	↗	Low	↘

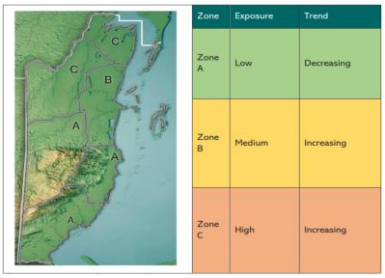
Source: (NCCO 2021)

Belize is expected to face stronger and more frequent hurricanes and storms over the next century due to rising air and sea surface temperatures, especially in northern regions. Although overall rainfall may decrease, intense rain events combined with hurricanes will increase flooding risks, particularly in Belize District and southern areas with major rivers. Warmer ocean waters will fuel storm intensity and reduce weakening when storms reach land. Additionally, rising sea levels will exacerbate coastal flooding and saltwater intrusion, further threatening vulnerable communities. This highlights the urgent need for investment in critical infrastructure, such as resilient homes and community-based shelters, to better protect people and livelihoods in a changing climate.

Hurricanes

52. The increase in global air temperature is expected to influence storm and hurricane formation in two main ways. First, it may reduce the strength of atmospheric convection due to a smaller temperature difference between the Earth's surface and the upper atmosphere. Second, it can lead to a decrease in the density of the troposphere. Both effects suggest that the overall formation of hurricanes may remain stable or even decline slightly. However, when focusing on the most intense storms—specifically Category 4 and 5 hurricanes—climate models indicate a different trend. Once global warming reaches +2ºC, a threshold aligned with IPCC projections and specific forecasts for Belize, the intensity of these storms is expected to increase by approximately 13%. This projected increase is largely due to higher atmospheric moisture from increased temperatures and reduced ocean salinity, which further enhances humidity. On the other hand, warming of the ocean's surface tends to occur in layers, meaning the deeper water remains cooler, potentially limiting the energy available to fuel hurricanes. Yet, in the case of Belize, the presence of the Mesoamerican Barrier Reef—about 80 kilometers offshore—creates a shallower ocean profile that reduces the effects of temperature stratification. This allows hurricanes approaching the coastline to continue drawing energy from the warm surface waters, potentially sustaining or even increasing their intensity as they near land.
53. The information provided below will describe how the behavior of hurricanes or tropical storms are expected to change as they approach the coasts of Belize. It is noteworthy that hurricanes tend to develop a northward component in their movement. This trend is evident in the consistently positive difference between the initial and final latitudes of storm tracks. Such a pattern could have important implications for how hurricanes may behave in the future, especially in the context of a changing climate. The trajectory of cyclonic-anticyclonic systems impacting Belize can be classified into three general patterns, each with distinct implications for different regions of the country (Figure 11):
    - Type 1 – Affecting Zone A:

54. In this scenario, the Mayan Mountains act as a barrier separating the cyclonic and anticyclonic systems. This separation allows the cyclone to make landfall with a degree of intensity due to the conservation of angular momentum. As one of the adjacent anticyclonic systems moves away, the cyclone's core expands, drawing in more energy. However, shortly after making landfall, the storm's intensity diminishes due to the lack of oceanic energy input. Because the anticyclonic systems are separated, this path does not usually produce significant rainfall. Additionally, Zone A maintains relatively high baseline rainfall levels, which means the land can absorb storm precipitation more effectively, reducing the risk of flooding. The probability of this path occurring depends on the likelihood of the storm having a sufficiently strong southerly component. Based on historical data, the probability of this type of trajectory is estimated at a maximum of 12%. At present, there are no climate projections that suggest an increase in the frequency of this type of hurricane path.
    - Type 2 – Affecting Zones A and B:
55. When the alignment of anticyclonic ~~center~~centres runs parallel or perpendicular to the coastline, the Mayan Mountains compress the system, initially slowing its progress and causing it to release a large volume of precipitation. Climate projections indicate that rising land surface temperatures and decreasing rainfall could intensify the impact of this path. Reduced rainfall would lead to drier, less permeable soils, which would take longer to absorb stormwater. This slower absorption increases the time the water remains on the surface, allowing for greater heat transfer from the land to the storm—fostering the Brown Ocean Effect. This phenomenon, in which the storm retains or gains energy from saturated warm soils, could become more prevalent. Due to the country's topography, Zone B would be most affected by this type of storm, and over time, the increased surface temperatures and soil saturation could amplify the Brown Ocean Effect, especially in northern Zone A and central Zone B. Currently, storms following this path are mostly major hurricanes (around 60%), although the Brown Ocean Effect has not yet been significantly observed.
    - Type 3 – Affecting Zones B and C:
56. If the system takes a more northerly path and the anticyclone is the first to interact with the Mayan Mountains, the storm is redirected northward. This trajectory leads the cyclone through areas already affected by reduced rainfall, resulting in highly saturated soils that amplify the Brown Ocean Effect due to the land's elevated surface temperatures. Moreover, the area between the mainland and Ambergris Caye acts as a persistent heat reservoir, supplying the storm with significant energy. Again, due to the conservation of angular momentum, the storm's core expands as it approaches the coast, increasing its destructive potential. Although this type of storm path is currently the least frequent, projections suggest its occurrence will increase over time. This pattern is also expected to be the most destructive due to both the energy the system acquires and its prolonged movement over land, greatly increasing risks in Zone C, particularly in terms of flooding.
57. One reason for the increasing likelihood of northerly trajectories is the observed slowdown in storm movement. Since 1947, the average forward speed of storms and hurricanes has decreased by 17%. This slowdown enhances the Coriolis effect, causing storms to veer further north. It is also believed that reduced atmospheric convection contributes to this trend. These shifts suggest that, while currently less common, Type 3 storms may become significantly more frequent and damaging in the future, a finding echoed in multiple studies.



Zone	Exposure	Trend
Zone A	Low	Decreasing
Zone B	Medium	Increasing
Zone C	High	Increasing

Figure 11: Projected Hurricane Exposure in Belize by Zone
Source:(NCCO 2021)

Key Findings include:

- Belize is highly vulnerable to hurricanes due to its location along frequent storm paths in the northwestern Caribbean.
- Northern Belize, especially Ambergris Caye and Caye Caulker, is at highest risk, being the

usual entry-exit point for hurricanes.
• Subtropical high-pressure systems influence hurricane paths, steering storms northward through Belize.
• Warm ocean waters and the brown ocean effect increase hurricane strength and inland impact, highlighting the need for better water drainage infrastructure.

58. The average number of Atlantic hurricanes has been steadily increasing over the few decades, and the trends are expected to be exacerbated by climate change according to various climate tracking models and projections like Yale Climate Connections. Belize is positions on the path of many of the hurricanes and tropical storms, historically being impacted by a direct landfall, or associated precipitation (H-Hattie-1961, H-Keith-2000, TS-Chantal-2001, H-Iris-2001, H-Dean-2007, H-Alex-2010, H-Richard-2010, TS Harvey-2011, TS Barry-2013, H Earl-2016, H Franklin-2017, H Nana 2020, H Lisa-2022, TS Nadine-2024, TS Sara-2024). The latter do not include hurricanes and tropical storms that do not have a direct landfall in Belize and tropical waves and depressions that have sometimes cause even more damage than direct landfalls (H Mitch-1998, H Iota-2020 and H Eta-2020).

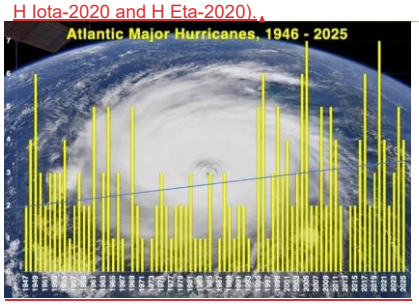


Figure 12: Number of major (Category 3 and stronger) Atlantic hurricanes, 1946-2025.

National Disaster Preparedness Baseline Assessment

58.59. In 2021, the Government of Belize, through the National Emergency Management Organization (NEMO) and with support from the Pacific Disaster ~~Center~~Centre, conducted a National Disaster Preparedness Baseline Assessment (Annex 2). The assessment identified critical gaps and systemic challenges that continue to hinder effective disaster management (DM) and disaster risk reduction (DRR) efforts.

59.60. A key finding was the chronic insufficiency of financial resources, which affects nearly every aspect of disaster management. The current DM budget is embedded within individual agency budgets rather than allocated as a dedicated national line item. Legislation does not mandate funding for DM activities, and NEMO's budget is largely limited to operational costs, basic training, and hurricane preparedness. Critical needs such as infrastructure upgrades, hurricane relief, and emergency operations are addressed on an ad hoc basis, as no contingency or relief funds exist. This reactive funding model limits the country's ability to implement proactive, long-term disaster resilience programs. The assessment also found that the enabling environment—including the legal and institutional framework—remains underdeveloped.

- Gaps in legislation governing all phases of disaster management

60.61. There are significant gaps in legislation governing all phases of disaster management, legal provisions for international cooperation, mandates for institutional structures at national and sub-national levels, and procedures for resource mobilization during emergencies. Additionally, disaster management legislation is not fully integrated or well understood across government entities. While existing plans such as the National Hazard Mitigation Plan (NHMP) are structured into volumes addressing various hazards and functions, most are outdated or incomplete, with some over a decade old.

61.62. The National Disaster Preparedness and Response Plan (NDPRP), which is legally required to be updated annually under the Disaster Preparedness and Response Act (2000), is meant to define preparedness protocols across ministries, coordinate implementation, and establish command structures, which are not currently in place. Although continuity of operations (COOP) and continuity of government (COG) planning is required, most plans remain under development. Belize has a dedicated Emergency Operations ~~Center~~Centre (EOC), but it is under-resourced and not fully capable of coordinating large-scale disaster response. Further, Belize participates in the Caribbean Catastrophe Risk Insurance Facility (CCRIF), coverage remains limited due to affordability issues, resulting in low private sector participation. Collectively, these findings highlight the urgent need for comprehensive policy reform, capacity development, and investment in disaster preparedness and risk reduction systems.

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- Lack of Disaster Management plans and strategies at national or local levels

62.63. There is a general absence of comprehensive disaster management (DM) plans and strategies at both the national and local levels, which limits the ability to guide and sustain capacity development efforts. Additionally, there are no formal assessment protocols in place to evaluate DM capacity or resource needs, primarily due to limited structured, forward-looking planning in this area. Although NEMO is the designated agency responsible for coordinating and supporting DM and disaster risk reduction (DRR) capacity development in Belize, it currently lacks the formal authority to mandate regular national-level training and exercises. As a result, such activities are carried out on an ad hoc basis. While training is included as a recurring budget item, it is often managed by staff who also have other full-time responsibilities. NEMO lacks the necessary resources to offer consistent, high-quality training and education programs. Although the organization conducts public awareness and education initiatives, the scale and effectiveness of these efforts remain unclear. Support for professionalizing disaster management through higher education is still in its early stages. Overall, capacity development in Belize is significantly constrained by the lack of strategic planning, institutional capacity, and financial resources.

63.64. There is also limited capacity and resources necessary to conduct comprehensive risk assessments, and NEMO does not maintain risk mapping capabilities. There are no institutionalized mandates or mechanisms requiring regular risk assessments, even though such assessments are essential for informing disaster management (DM) and disaster risk reduction (DRR) planning. As a result, risk assessments are not routinely performed. The use of Geographic Information Systems (GIS) for risk data collection and analysis is absent, and there are no regulatory requirements at the national or subnational levels for risk-based planning. These gaps also hinder capacity development efforts and limit the ability to integrate risk data into the national development process. While some progress has been made in communication and information management, particularly in disaster assessments, significant gaps remain.

- Early warning systems are fragmented and lack centralization

64.65. Major hazards are monitored, with NEMO coordinating hazard information based on advisories from the National Meteorological Service (NMS) or the Ministry of Natural Resources (MNR), using up-to-date methods for certain hazard types. However, early warning systems (EWS) are fragmented and lack centralization. Notification methods vary by location, and in many areas, hazard alerts are still delivered door to door by Community Disaster Response Team (CDRT) volunteers. Although standard procedures for early warning are in development, current systems remain heavily reliant on volunteer networks, particularly in rural or underserved areas. EWS coverage is estimated to reach only a portion of the population, and while some communities receive pre-disaster training, consistent public education on early warning messages and response actions is lacking.

- NEMO's Damage Assessment and Needs Analysis

65.66. NEMO's Damage Assessment and Needs Analysis (DANA) Committee has a Plan of Action that outlines procedures for initiating assessments within two to eight hours after the onset of a disaster. These assessments inform critical decisions, including the declaration of disaster events, and generally show strong performance in immediate post-disaster contexts. However, while assessment data play an important role in incident response planning, they are not systematically integrated into long-term preparedness efforts. This is partly due to the absence of mechanisms for incorporating both pre- and post-disaster data into risk modeling and predictive analysis, which limits Belize's ability to reduce vulnerability and build resilience to future events.

Financial Barriers to Climate-Resilient Housing in Belize.

66.67. In Belize, the financial sector consists of a mix of formal, semi-formal, and informal entities, including domestic and international banks, credit unions, and insurance companies. Despite this diversity, the system is highly concentrated, with the three largest domestic commercial banks controlling approximately 84% of the market's assets, loans, and deposits. This concentration results in limited competition, which typically correlates with higher financing costs and less accessible services. The high cost of financing remains a significant barrier for many Belizeans, especially those seeking to build climate-resilient homes. While the country's financial system has deepened over time, it has shown a consistent decline in recent years. The average lending rate in Belize is around 9%, significantly higher than the weighted deposit rate of 1.2%. The difference, or interest rate spread, remains substantial at 7.1% as of 2018, reflecting the high-risk premiums and inefficiencies within the market. Compounding this lack of access to affordable financing is the challenge of inequity in accessing finance. Accessing loans are more common among men, who receive 61% of bank loans, compared to 39% for women (UNWOMEN et. al, 2021). Where residential lending is concerned, more loans were provided to men, but the sizes of the loans are similar for men and women. Among indigenous communities, ownership of land and property (predominantly male) is related to why there are more men accessing these financial resources.

67.68. Access to affordable finance for critical needs such as climate-resilient housing is further limited by underdeveloped financial infrastructure, shallow capital markets, and low financial literacy. While the government and some private players have introduced small-scale financial products targeting underserved groups, including women, small farmers, and rural communities, these initiatives remain limited in scope and have not reached widespread adoption. The absence of innovative, targeted financial products—such as affordable microfinance for climate-resilient homes—combined with regulatory and technological barriers, prevents many Belizeans from accessing financing solutions that could help them build more resilient housing in the face of increasingly frequent storms and floods. A more competitive, inclusive, and innovative financial ecosystem is needed to reduce financing costs and expand access to affordable, climate-adaptive housing solutions.

An indebt analysis on the financial Barriers to climate resilient housing will be conducted during the development of the full funding proposal.

Other Needs and Barriers to be addressed.

68.69. Strengthening climate adaptation and early warning systems is a critical need due to the increasing frequency and intensity of hurricanes and floods. This requires investment in hydrology services for flood modeling, enhancement of meteorological (MET) capabilities with radar, forecasting tools, automated weather stations, and the integration of data from hydrology, MET, and NEMO to generate effective alerts. However, system integration remains a major barrier, with current services operating in silos, limiting the delivery of coordinated, real-time information. Additionally, there is a need to upgrade radar systems, satellite receivers, sea buoys, and high-performance computing infrastructure, primarily due to funding constraints and technical capacity gaps.

69.70. The National Common Alerting Protocol (CAP) system operated by NEMO, though operational, lacks full integration with telecommunications networks, which limits its ability to deliver geo-targeted alerts via mobile phones, television, and radio. To meet this need, investments are required in hardware, software, and strategic telecom partnerships. However, technical limitations and weak engagement with telecom providers present ongoing barriers to widespread and reliable public alerting, especially in rural areas with limited network coverage.

70.71. Improving housing resiliency is a key priority, particularly in coastal zones vulnerable to storm surge and flooding. There is a strong need to retrofit existing homes and shelters, promote inland construction, and support households through a proposed national fund that would offer low-interest loans for retrofitting, reconstruction, or relocation. Yet, barriers such as financial inaccessibility, limited public awareness of safer housing options, and resistance to relocation persist. Shelter assessments have shown that about 40% of existing shelters require retrofitting, but a lack of resources and technical oversight hinders progress.

71.72. Engaging the construction sector is essential to scaling up resilient housing solutions. Training for small-scale builders on climate-resilient construction, along with public awareness campaigns, would help drive safer building practices. However, many builders lack access to technical data and design standards, and households may not prioritize or afford resilient upgrades without targeted incentives or education.

72.73. In the area of infrastructure and warehousing, there is an urgent need to retrofit or relocate vulnerable NEMO facilities, particularly the Ladyville warehouse, which is at high risk of flooding. All warehouses should be equipped with solar backup power and water purification systems to ensure operational functionality during disasters. However, limited budgets often impede timely upgrades, leaving these critical facilities exposed.

73.74. The development of a locally managed Disaster Management Information System is also a priority. This system would support real-time damage assessments, integrate risk mapping and early warning tools, and centralize data management. Local development is preferred to avoid costly foreign subscriptions and to ensure context-appropriate design. However, the lack of technical expertise and skilled personnel to build and maintain such systems poses a significant barrier, as does the current dependence on fragmented or outdated data platforms.

74.75. Capacity building and training are urgently needed to support long-term disaster management goals. Recruiting and training meteorologists, forecasters, and technicians, particularly in hurricane modeling, forecasting tools, and data analysis—is essential. Additionally, establishing Community Emergency Response Teams (CERTs) in urban and eventually rural areas would strengthen grassroots response capacity. However, human resource shortages and limited training programs present serious implementation challenges.

75.76. In terms of data and communication systems, there is a need to integrate satellite, radar, and ground-based observations into a centralized system. Early warning communication tools such as SMS, mobile apps, and radio alerts must be developed to ensure rapid public dissemination. Yet, these improvements are

hindered by technological limitations, inconsistent data availability, and underdeveloped communication infrastructure, especially in underserved areas.

~~76.~~77. Finally, stakeholder engagement and communication are essential for improving public resilience and coordination across agencies. Partnerships with disaster management authorities, local governments, and the media need to be strengthened to support cohesive emergency messaging and community outreach. Despite this, institutional coordination remains weak, and community engagement is often sporadic or reactive. Sustained investment in education and trust-building is needed to shift public behavior and improve disaster preparedness at the local level.

Proposed solution to the problem

~~77.~~78. To address the increasing vulnerability of communities in Belize to climate-related hazards outlined above, this project proposes the implementation of climate-resilient and inclusive housing solutions, supported by an innovative revolving finance mechanism. A national fund will be established to provide low-interest loans, enabling vulnerable households to retrofit, reconstruct, or relocate their homes to safer ~~areas.All~~areas. All housing solutions will adhere Belize's 2024 Building Code that is based on the ~~to national and~~ international building ~~standards~~ that integrates resilience standards.~~,~~ Resilient construction using reinforced concrete to withstand sustained winds of ~~111 – 129~~up to 157 mph, ~~ensure structural resilience against at minimum~~ (Category ~~3~~5) hurricane ~~wind loads~~, flooding, and storm surges. Furthermore, other k~~K~~ey design features will include elevated foundations above flood risk levels (to elevate houses to a height that is above the most severe flood, both in the design and location of placement) to reduce exposure to flooding, ~~the use of reinforced concrete~~ and hurricane straps to improve structural integrity against high winds, sloped roofs and water-resistant roofing materials to facilitate drainage and reduce water infiltration, and the installation of storm shutters or impact-resistant windows to protect against windborne debris and maintain safety during severe storms. Housing designs and drawings will be provided during the development of the full funding proposal, which will be to withstand category 5 systems, although with climate change, conventional designs for category 5 systems may need to be revisited, as was apparent in Jamaica with Hurricane Melissa. ~~.~~

~~78.~~79. All structural design and construction will be guided by the currently under revision National Building Codes, National Planning and Development Bill, 2025, and the recently revised National Land-use Policy of Belize (2025). The project will build on existing pipeline revision to infrastructure guidelines and regulations. Even though the project cannot directly imact the lives of the

~~79.~~80. This approach not only reduces immediate risks but also supports long-term adaptation. The project will also invest in building local capacity for resilient construction practices and community planning, ensuring sustainability and local ownership. To further strengthen national climate resilience, the project will enhance the capabilities of the Belize National Meteorological Service and the National Emergency Management Organization, improving early warning systems and disaster preparedness. Together, these interventions will create a scalable model for resilient housing finance and disaster risk reduction, protecting lives, livelihoods, and infrastructure across Belize.

Project/Programme Objectives:

List the main objectives of the project/programme.

~~80.~~81. The project aims to strengthen national disaster preparedness and response capacities, improving hurricane monitoring and early warning systems, and promoting climate-resilient housing and infrastructure through an innovative financing mechanism. Specifically, the objectives of the project are:

- Enhance the capacity of the National Emergency Management Organization (NEMO) to effectively prepare for, respond to, and recover from hurricanes by improving institutional frameworks, emergency response protocols and infrastructure, and community engagement strategies. This will ensure timely and coordinated disaster management, ultimately reducing loss of life and damage to property.
- Support the Belize National Meteorological Service to upgrade its hurricane monitoring and tracking capabilities by investing in advanced technologies, training, and data management systems. Strengthened meteorological services will provide more accurate and timely early warnings, enabling authorities to take proactive measures ahead of climate-related hazards.
- Establish a revolving finance fund to provide accessible, low-interest loans for vulnerable households and communities to retrofit, reconstruct, or relocate homes and critical infrastructure to safer, climate-resilient standards. This fund will encourage sustainable investments in resilient construction and infrastructure upgrades, reducing exposure to climate hazards such as hurricanes and flooding.
- Additionally, the project will build local capacity through training and technical support in resilient building

practices and community-based planning, fostering local ownership and ensuring the sustainability of adaptation measures. By integrating institutional strengthening, improved early warning systems, and financial empowerment of vulnerable communities.

Project/Programme Components and Financing:

Fill in the table presenting the relationships among project components, activities, expected concrete outputs, and the corresponding budgets. If necessary, please refer to the attached instructions for a detailed description of each term.

For the case of a programme, individual components are likely to refer to specific sub- sets of stakeholders, regions and/or sectors that can be addressed through a set of well defined interventions / projects.

Project/Programme Components	Expected Concrete Outputs	Expected Outcomes	Amount (US$)
1. Enhance the Capacity of Belize's National Emergency Management Organization	1.1 Early warning system focused on hurricane and storm preparedness upgraded to deliver geo-targeted alerts through mobile notifications and TV/radio interruptions. 1.2. Disaster Management Information System (DMIS) is established, enabling real-time damage assessments via mobile devices, and integrating early warning systems, risk mapping, and historical data. 1.3 Critical infrastructure for hurricane response and recovery retrofitted to with flood protection, solar power, and water purification systems to ensure reliable hurricane response and recovery operations. 1.4 Local disaster preparedness and response capacity is enhanced through strengthened data analysis, network administration, and disaster mitigation planning and policies.	1.1.1. National Systems for Hurricane Preparedness, Response, and Recovery Strengthened. 1.2.1 Real-time situational awareness with data-driven decision making. 1.3.1 Increased resilience and continuity of response operations in providing reliable emergency services. 1.4.1 Improved local decision-making; stronger technical infrastructure and increased community preparedness during emergencies.	$2,000,000
2. Support to the National Meteorological Service for Enhanced Hurricane Monitoring and Tracking.	2.1 National meteorological and hydrological services are strengthened through investments in flood modeling, forecasting tools, and weather radar systems, satellite receivers, and high-performance computing infrastructure. 2.2 Enhanced capacities in hurricane modeling and forecasting tools.	2.1.1 Meteorological and Hydrological Services ~~for~~ ~~I~~improved ~~Hurricane~~ Monitoring and Forecasting ~~Strengthened~~capabilities. 2.2.1 Advanced hurricane and flood modeling systems and early warning dissemination.	$2,000,000

	2.3 Integrated data management system established by combining satellite, radar, and ground-based observations with centralized data archiving.	2.3.1 Centralized data management integrated with NEMO.	
3. Climate-Resilient Housing and Critical Infrastructure through Innovative Finance for Vulnerable Communities in Belize	3.1 Legal, financial, and institutional frameworks to ensure the sustainable management and governance of the revolving fund for climate-resilient housing and infrastructure established 3.2. At least 200 homes in vulnerable communities are retrofitted, upgraded, or relocated to climate-resilient standards. 3.3. At least 10 public buildings designated as hurricane shelters or utilized during storms are reinforced and upgraded to provide safe and reliable refuge during extreme weather events. 3.4 Local actors are empowered with the knowledge and skills to build and maintain resilient structures, supported by transparent reporting mechanisms and the systematic sharing of lessons learned to promote continuous improvement and community resilience.	3.1.1 Sustainable Financing and Local Capacity for Climate-Resilient Housing and Infrastructure Strengthened 3.2.1 Increased community resilience. 3.3.1 Reinforced shelter providing increased safety and protection. 3.4.1 Increased local capacity for resilience.	$18,000,000
4. Enabling environment for climate actions in Belize enhanced	4.1 Enhance national awareness for impactful climate investments in Belize 4.2 Enhance the capacity of regulating agencies in Belize to promote and create an enabling environment for climate interventions	4.1.1 Enhanced national coordination and awareness on climate hazards	$800,000
5. Project/Programme Execution cost			$342,000
6. Total Project/Programme Cost			$ 23,142,000
7. Project/Programme Cycle Management Fee charged by the Implementing Entity (if applicable)			$1,858,000
Amount of Financing Requested			$ 25,000,000

Projected Calendar:

Indicate the dates of the following milestones for the proposed project/programme

Milestones	Expected Dates
Start of Project/Programme Implementation	January 2027

Mid-term Review (if planned)	June 2029
Project/Programme Closing	January 2032
Terminal Evaluation	December 2031

PART II: PROJECT / PROGRAMME JUSTIFICATION

A. Describe the project/programme components, particularly focusing on the concrete adaptation activities of the project, and how these activities contribute to climate resilience. For the case of a programme, show how the combination of individual projects will contribute to the overall increase in resilience.

~~81.~~82. The Government of Belize acknowledges that, despite its ambitious adaptation efforts across multiple sectors, the country remains acutely vulnerable to the adverse impacts of climate change and the inevitable loss and damage caused by extreme weather events. The increasing frequency and intensity of storms and hurricanes, combined with social vulnerabilities, pose serious threats to livelihoods, critical infrastructure, and the well-being of its people. Addressing the risks is therefore essential to safeguarding the progress achieved through adaptation and resilience-building, particularly in key sectors such as human settlements and infrastructure. In this context, the proposed project activities are focused on strengthening national capacity to anticipate, withstand, and recover from climate-related shocks, while prioritizing the protection of vulnerable populations. This includes the integration of risk reduction, disaster preparedness, and climate-resilient development across communities, alongside the enhancement of social safety nets. The interlinked components will focus on building national resilience through investments in strengthening institutional structures, data driven decision-making, sustainable financing for climate response for the most vulnerable and enhanced national coordination for climate action.

Component One: Enhance the Capacity of Belize's National Emergency Management Organization

~~82.~~83. This component aims to enhance the country's overall capacity to manage hurricane-related risks more effectively and efficiently. This will be achieved by improving institutional frameworks, coordination mechanisms, and operational readiness across all phases of the disaster management cycle. Strengthened systems will enable timely preparedness actions, faster and more coordinated emergency responses, and more resilient recovery processes. Efforts under this outcome will ensure that NEMO is better equipped with the tools, information systems, standards, and infrastructure needed to anticipate, withstand, and recover from the impacts of hurricanes.

~~83.~~84. The National Emergency Management Organization (NEMO) was officially established on February 1, 1999, following the threat posed by Category 5 Hurricane Mitch. Initially created to coordinate preparedness and response efforts for hurricanes and floods, NEMO has since expanded its mandate to address a broader range of natural and man-made hazards. As the sole government authority responsible for national emergency management, NEMO is mandated to ensure that Belize remains in a constant state of readiness to respond to any emergency requiring national coordination. Operating as a full-time government department, NEMO is tasked with leading disaster risk management efforts across the public and private sectors including training, preparedness, mitigation, response, and recovery.

Output 1.1: Early warning system focused on hurricane and storm preparedness upgraded to deliver geo-targeted alerts through mobile notifications and TV/radio interruptions.

~~84.~~85. Effective early warning systems are a cornerstone of disaster risk reduction, enabling communities, authorities, and response agencies to act quickly and minimize the impacts of hazards. This project seeks to strengthen national early warning capacities across the entire warning chain: from hazard detection and data analysis to timely, accessible communication with all segments of the population. By modernizing the National Emergency Operations ~~Center~~Centre (NEOC), improving data processing capabilities, and ensuring inclusive dissemination of warnings, the project aims to build a more resilient and responsive early warning system that leaves no one behind (Figure 12).

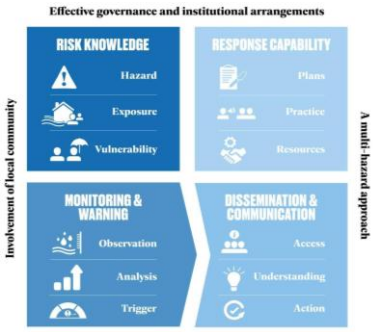

Figure 12: Principles of developing the early warning system

85.86. This project will significantly enhance the country's early warning system by first equipping the National Emergency Operations ~~Center~~Centre (NEOC) with updated communication and computer equipment. A modernized NEOC will serve as the central hub for receiving, processing, and disseminating early warning information. Upgraded hardware, software, and secure communication infrastructure will enable faster, more reliable coordination and ensure continuity of operations during emergencies.

86.87. An essential aspect of strengthening early warning lies in the ability to effectively process multi-hazard monitoring data. The project will invest in systems that can integrate data from various sources and translate that information into actionable early warnings. By improving the analytical capabilities and automation of these systems, NEMO will be better equipped to issue timely and accurate alerts that reflect the full scope and scale of potential threats.

87.88. Recognizing that timely information alone is not sufficient if it does not reach those at risk, the project will also develop alternative mechanisms to communicate early warnings to populations in areas with little or no access to internet, television, or radio. These mechanisms may include community sirens, mobile loudspeakers, SMS-based alerts, and other innovative, low-tech solutions that function independently of conventional infrastructure. These efforts ensure that critical warnings reach even the most remote or underserved communities *(to be designed with community members during the development of the full funding proposal)*.

88.89. To make early warnings actionable, it is vital that messages are understood by everyone, regardless of education level. Therefore, the project will design early warning communications using plain language, culturally relevant visuals, and accessible formats tailored for individuals with less than a secondary education. This will help ensure that people can not only receive but also clearly interpret and respond to warnings.

89.90. Lastly, the project will promote inclusivity in the early warning system by upgrading hazard monitoring technologies and encouraging the use of information and communication technologies (ICT) among vulnerable population groups. Special attention will be given to the elderly, persons with disabilities, and those who are socially isolated, who are often the least likely to receive and act upon warnings. By providing accessible tools, targeted outreach, and training, the project will help these groups stay informed and respond effectively before, during, and after hazard events and respond effectively before, during, and after hazard events.

Output 1.2: Management Information System (DMIS) is established, enabling real-time damage assessments via mobile devices, and integrating early warning systems, risk mapping, and historical data.

90.91. Under this output, NEMO will achieve several key improvements aimed at enhancing disaster management and disaster risk reduction through better data accessibility, coordination, and informed decision-making. One of the primary goals is to develop a national common operating picture platform. This platform will provide a unified view of real-time information and situational awareness across all levels of government, thereby improving coordination, collaboration, and the overall efficiency of emergency response operations (Figure 13).

Figure 13: Disaster Information Management

~~91.~~92. To further support information management, the project will establish a centralized, digitized repository to house all relevant disaster-related data, documentation, and information. This central hub will allow for easier access to historical and real-time information by NEMO, government agencies, and partners, supporting both operational planning and post-disaster analysis.

~~92.~~93. In parallel, the project will lead the development of national standards for data collection, management, storage, and sharing. These standards will ensure that all disaster management data are captured in a consistent, high-quality, and fully digitized format. The standardized data framework will facilitate interoperability between government agencies, NGOs, and other stakeholders, enhancing evidence-based decision-making before, during, and after disasters.

~~93.~~94. Finally, to support timely response and recovery, the project will build capacity for conducting real-time damage assessments. This includes deploying tools and methodologies that enable the rapid collection and analysis of impact data in the immediate aftermath of a disaster, allowing NEMO, Ministry of Natural Resources and Ministry Sustainable Development and Climate Change and other partners to better prioritize resources, inform the public, and guide early recovery planning.

Output 1.3: Critical infrastructure for hurricane response and recovery retrofitted with flood and wind protection, solar power, and water purification systems to ensure reliable hurricane response and recovery operations.

~~94.~~95. As part of efforts to strengthen national hurricane preparedness and response systems, this output will ensure that NEMO's central warehouse and designated response ~~center~~centres identified as high-risk are retrofitted to withstand the impacts of up to a Category 4 hurricane. These critical facilities (i.e., emergency operations ~~center~~centres and emergency warehouses) will be structurally reinforced and equipped with solar energy backup systems to maintain operations during power outages, as well as water purification systems to support continuity of relief efforts and basic services in the aftermath of a storm.

~~95.~~96. The scope and specifications of the retrofitting work will be informed by a detailed assessment and engineering designs, which will be completed during the development of the full funding proposals. By upgrading the physical resilience and operational sustainability of these key emergency hubs, the project will enhance NEMO's ability to coordinate and deliver timely humanitarian assistance before, during, and after major hurricane ~~events.NEMO's~~events. NEMO's disaster risk response capacity in Belize is heavily supported by critical infrastructure, particularly its central warehouse and designated response ~~center~~centres. These facilities are essential for ensuring that emergency response operations are efficient, timely, and effective. Their strategic placement across the country is a key factor in reducing response times, which can often mean the difference between life and death during a disaster. Just as important as their location is their ~~functionality~~functionality, ensuring that these facilities are fully operational, properly equipped, and structurally sound is critical to their ability to support emergency operations when they are most needed.

~~96.~~97. The central warehouse serves as the main storage facility for emergency supplies such as food, water, hygiene kits, tarpaulins, medical items, and other essential resources. Because of its central location and maintained functionality, the warehouse allows for rapid mobilization and distribution of supplies to any part of the country. This ensures that communities affected by hurricanes, floods, or other disasters receive timely assistance, especially during the critical first hours and days following an event.

~~97.~~98. In addition to the warehouse, NEMO has established designated response ~~center~~centres throughout Belize. These ~~center~~centres are strategically located in key areas so that emergency teams can respond quickly and effectively, even in remote or hard-to-reach locations. The functionality of these ~~center~~centres is

equally important, they must be equipped with communication tools, emergency supplies, and the structural resilience to remain operational during and after disasters. They serve as operational hubs for local disaster response, including coordination of search and rescue efforts, shelter management, communication with headquarters, and support to affected residents.

98.99. By investing in, maintaining, and ensuring the full functionality of this critical infrastructure, NEMO significantly enhances Belize's national preparedness and resilience. These facilities are not just buildings—they are lifelines that enable faster, more organized, and more effective disaster response and recovery efforts. Ultimately, their presence and operability ensure that help reaches those in need as quickly as possible, saving lives and reducing the long-term impact of disasters on communities.

99.100. Also, - Complementing this, a comprehensive disaster risk management training and education curriculum will be developed to address emerging challenges and include all relevant local stakeholders, thereby building capacity across communities and organizations at the grassroots level.

101. To support resilient recovery efforts at the local level, risk financing mechanisms tailored to the private sector will be introduced, helping Small and Medium-sized Enterprises (SEMs) better prepare for and rebound from disaster impacts (special consideration will be given to women-led SMEs). Strengthening policy and planning frameworks will ensure that NGOs, private sector partners, and other local organizations are fully integrated and formally engaged in coordinated disaster management efforts.

~~100.~~

Output 1.4 "Local disaster preparedness and response capacity is enhanced through strengthened data analysis, network administration, , and disaster mitigation planning and policies.

102. These inputs will assist in strengthening NEMO and NMS to provide real-time communication and coordination during emergencies and provide guiding policies to strategically locate and adapt houses to local hazard profiles and land-use planning and maintenance standards for resilient housing. The design of this component is developed with close coordination with the NMS and NEMO.

~~101. Please note - Also include a notation that alignment and compliance will be further strengthened at fully-developed proposal stage.~~

102.103. Finally, a national plan will be developed to guide the integration of DRR, Climate Change Adaptation, and the Medium-Term Development Goals 2 (MTDS) into national and sub-national planning processes. This will include active involvement of local governments to ensure that mitigation policies and practices are aligned with broader national and global resilience goals. The plan will also establish processes to monitor and track progress, ensuring continuous improvement of local preparedness and response capacity through data-driven decision-making and strengthened administrative networks.

Component 2: Support to the National Meteorological Service for Enhanced Hurricane Monitoring and Tracking.

103.104. The project will strengthen Belize's capabilities in hurricane monitoring and forecasting by investing in critical meteorological and hydrological infrastructure and technical capacity. Belize's National Meteorological and Department of Hydrology will receive upgraded weather radar systems, satellite receivers, and high-performance computing infrastructure to support hurricane modeling and forecasting tools. These technological enhancements will improve the accuracy and timeliness of hurricane tracking and intensity predictions. Alongside this, specialized training will be provided to meteorologists and hydrologists to build expertise in utilizing advanced forecasting models. An integrated data management system will be established, combining satellite, radar, and ground-based observations into a centralized archive, enabling real-time data analysis and more effective information sharing. Together, these efforts will significantly strengthen Belize's hurricane monitoring and forecasting capabilities, leading to earlier warnings and better preparedness for hurricane impacts.

104.105. The National Meteorological Service of Belize (NMS) is the country's authoritative agency for weather and climate information. It plays a critical role in safeguarding lives, supporting key economic sectors, and promoting sustainable national development. The NMS provides a wide range of services, including daily public weather forecasts disseminated via radio, television, newspapers, and its official website. It delivers aviation weather information to ensure the safety of air travel, and marine forecasts tailored for the shipping, fishing, and tourism industries. Specialized agrometeorological services support farmers and agricultural planning through rainfall outlooks, drought monitoring, and seasonal advisories. The Service also plays a key role in disaster risk reduction by working closely with the National Emergency Management Organization (NEMO), offering expert guidance on hurricanes, floods, and other hazardous weather events that could threaten the country.

105.106. Beyond forecasting, the Department of Hydrology is responsible for hydrometeorological monitoring, collecting and analyzing data on rainfall, river levels, and water resources to support flood prediction and water management. It also contributes to climate monitoring and reporting, analyzing long-

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term trends in temperature, rainfall, and extreme weather events to guide national planning and policy. The Service provides technical input on Environmental Impact Assessments through its participation in the National Environmental Appraisal Committee (NEAC), and it supports climate change efforts as a member of the Belize National Climate Change Committee.

~~106.~~107. Operationally, the NMS maintains a network of weather observation stations, weather radar for storm tracking, and an upper-air observation site for atmospheric profiling. Forecasters use advanced tools including satellite reception systems and numerical weather prediction models. The department is staffed by trained meteorologists, forecasters, technicians, and support personnel. Internationally, Belize is a member of the World Meteorological Organization (WMO), and the NMS represents the country in the Intergovernmental Panel on Climate Change (IPCC), the Caribbean Meteorological Organization (CMO), and the Comité Regional de Recursos Hidráulicos (CRRH) under the Central American Integration System (SICA). Since its origins in 1887 and formal establishment as a national service in 1972, the NMS has evolved into a critical institution supporting Belize's resilience, environmental stewardship, and national development through timely, reliable, and science-based weather and climate services.

Output 2.1: National meteorological and hydrological services are strengthened through investments in flood modeling, forecasting tools, and weather radar systems, satellite receivers, and high-performance computing infrastructure

~~107.~~108. Under this activity, key outputs will be achieved to strengthen Belize's National Meteorological and Department of Hydrology. A comprehensive needs assessment will first be conducted to identify existing capacity gaps, technical requirements, and priority areas for investment. Based on this assessment, targeted investments will be made in national hydrology services to enhance flood modeling capabilities, including the procurement of updated monitoring equipment and modeling software.

~~108.~~109. Meteorological services will be strengthened through the installation and upgrading of weather radar systems, satellite receivers, and advanced forecasting tools to improve hurricane monitoring and early warning accuracy. High-performance computing infrastructure will be deployed to support real-time data processing and complex hurricane modeling.

~~109.~~110. Additionally, technical staff will receive specialized training to operate and maintain these systems effectively. An integrated data management system will also be established, bringing together satellite, radar, and ground-based observations into a centralized archive to support timely decision-making and coordinated disaster response.

Output 2.2: Enhanced capacities in hurricane modeling and forecasting tools

~~110.~~111. Under this activity, the project will support the recruitment of key technical staff, including meteorologists, technicians, and forecasters, to build a more capable and responsive National Meteorological Service. These professionals will receive specialized training in advanced hurricane modeling techniques and forecasting tools to enhance their technical expertise. Regional exchange programs and partnerships with established meteorological ~~center~~centres will be facilitated to promote knowledge sharing and professional development.

~~111.~~112. In parallel, the project will compile and analyze baseline data on hazard risks and vulnerabilities in the target areas to guide the development of a Multi-Hazard Impact-Based Forecast and Early Warning System (MH-IBF-EWS). This will involve identifying relevant weather and climate indicators, defining critical thresholds for different hazards—such as flooding, storm surge, heatwaves, strong winds, drought, and severe thunderstorms—and designing clear, timely, and actionable warning messages for use by the National Meteorological Service and the National Emergency Management Organisation (NEMO).

~~112.~~113. The project will also support the generation of probabilistic forecasts for extreme weather events across various timescales, including sub-seasonal to decadal, tailored to multiple hazards and sectors. Collectively, these efforts will enhance Belize's ability to anticipate, communicate, and respond to hurricane threats and other climate-related risks more effectively. This will significantly enhance the national capacity to prepare and take proactive measures to building climate resilience in the national housing sector through improved data driven decision making.

Output 2.3: Integrated data management system established by combining satellite, radar, and ground-based observations with centralized data archiving.

~~113.~~114. Under this activity, the following outputs will be achieved to improve coordination, data integration, and operational efficiency in Belize's early warning and forecasting systems. First, hydrology, meteorology, and National Emergency Management Organisation (NEMO) data will be integrated to support the generation of timely and actionable alerts for disaster risk reduction.

~~114.~~115. The project will also ensure the integration of multiple data sources, including satellite imagery,

weather radar, and ground-based observations, to provide a more comprehensive and accurate understanding of evolving weather and hydrological conditions. To manage this information effectively, a centralized data management and archiving system will be implemented, enabling real-time access, analysis, and storage of critical data. In addition, automated weather stations and sea buoys will be installed across key locations to facilitate continuous and real-time data collection, particularly for monitoring atmospheric and oceanic conditions.

~~115.~~116. Finally, standard operating procedures (SOPs) will be developed and formalized to clearly define the roles and responsibilities between the Meteorological Service and the Hydrology Agency, ensuring coordinated actions during extreme weather events. These outputs will collectively contribute to a more integrated and responsive forecasting and early warning system in Belize.

Component 3: Climate-Resilient Housing and Critical Infrastructure through Innovative Finance for Vulnerable Communities in Belize

~~116.~~117. Component 3 aims to enhance the resilience of vulnerable communities by establishing sustainable financial mechanisms and building local capacity to support climate-resilient housing and infrastructure. The primary outcome of this component is the creation of accessible financing options that empower individuals and communities to invest in safer, more durable housing and public infrastructure. This will be achieved through the establishment of a low-interest Resilient Housing Revolving Fund, which will provide affordable loans to households, particularly those in high-risk areas, for the construction or retrofitting of homes to withstand hurricanes. In addition, grants will be provided to retrofit critical community infrastructure, such as shelters, schools, and health ~~center~~centres, to ensure they remain operational and safe during extreme weather events. By combining financial support with technical assistance and implemented in partnership with the Development Finance Corporation (DFC) and other local entities, this component will build the foundation for scalable, community-led climate resilience and promote long-term adaptation through inclusive and sustainable financing solutions. The revolving fund supported by AF's grant will ensure that there is a financially sustainable fund to support vulnerable populations with a dedicated fund that is accessible to them. The low interest will be used for the exit strategy of the project investment.

~~117.~~118. DFC, Belize's only national development bank was established in 1963. DFC plays a pivotal role in supporting the country's sustainable economic growth by providing development financing to individuals, businesses, and organizations. As a non-deposit financial institution, DFC sources funding from regional and international lenders at preferential rates and on-lends to Belizean nationals, residents, and locally registered entities with majority Belizean ownership. Guided by its mission to offer innovative financial solutions that contribute to resilient and equitable development, and its vision of becoming a leading development finance institution driven by digital transformation and strategic partnerships, DFC aligns closely with the goals of this activity. Its strategic focus areas, including climate resiliency, impact broadening, and alliance-building—make DFC a key implementing partner. The Corporation's strong track record in supporting residential and productive sector growth, including an 80% increase in its residential loan portfolio between 2019 and 2023, demonstrates its capacity to contribute meaningfully to this initiative.

Output 3.1: Legal, financial, and institutional frameworks to ensure sustainable management and governance of the revolving fund for climate-resilient housing and infrastructure established.

~~118.~~119. An important output of this component will be the design and establishment of a low-interest Resilient Housing Revolving Fund, aimed at providing affordable financing for climate-resilient housing to vulnerable populations, including women, Indigenous peoples, and other at-risk groups. This fund's design will be informed by a comprehensive vulnerability assessment and a clearly defined selection criteria, both to be developed during the preparation of the full funding proposal to ensure equitable and inclusive access.

~~119.~~120. A strong policy framework will be established to guide the fund's operation, covering eligibility requirements, loan conditions, environmental and social safeguards, as well as transparency and accountability measures. A dedicated Fund Management Unit (FMU) will be set up to oversee fund administration, monitoring, and reporting.

~~120.~~121. Loans will be provided directly through the Development Finance Corporation, leveraging its experience and institutional capacity to deliver financial products effectively. Through DFC's existing networks and expertise, the fund will ensure that financing reaches those most in need. This approach will empower women, Indigenous peoples, and other vulnerable groups to build or retrofit homes that can better withstand hurricanes and extreme weather, supporting long-term community resilience.

Output 3.2: At least 1000 homes in vulnerable communities are retrofitted, upgraded, or relocated to climate-resilient standards.

122. This outcome will be accomplished by retrofitting, upgrading, or construction of at least 1000 homes in

vulnerable communities to meet climate-resilient standards. The selection and implementation process will be guided by a thorough Environmental and Social Risk Screening to ensure that interventions minimize negative impacts and promote sustainability. Additionally, all works will comply with existing building codes, land use, and zoning policies to ensure safety, legality, and suitability to local conditions.

~~121.~~123. Community needs assessments will be conducted in communities in participatory workshops to identify social risks such as displacement, gender inequity, and accessibility barriers. Furthermore, assessments on ecosystems and water resources to ensure minimal negative impacts and promote sustainability The beneficiary selection process will prioritize households based on vulnerability (poverty level, disaster exposure and disability status).

~~122.~~124. Beneficiaries who qualify for new construction will choose from a range of pre-approved resilient housing designs, specifically tailored to the different hazard zones and environmental conditions within Belize. This approach ensures that homes are built to withstand local climate risks such as hurricanes, flooding, and storm surge.

~~123.~~125. To further reduce financial vulnerability and support risk management, the project will develop a specialized insurance scheme in partnership with local insurance providers. This scheme will offer coverage at a reduced cost to beneficiaries, helping protect their investments and encourage participation. This activity complements ongoing investments by the Government of Belize to provide low-income homes for families and will primarily target the working poor, ensuring that climate resilience reaches those most in need.

~~124.~~126. A draft loan product, including preliminary terms and conditions, has been prepared and is attached as an Annex 3. However, this draft will be carefully reviewed, refined, and finalized during the full funding proposal development phase to better meet the needs of beneficiaries and align with the overall project objectives.

~~125.~~127. All houses retrofitted, upgraded or relocated will be on a set of pre-approved housing plans that will be designed from a climate resilience context and in-line with all national building codes, human settlements and infrastructure development plans/strategies/frameworks, and national environmental regulations and guidelines. The design of the houses built or retrofitted will building on currently ongoing revisions to human settlement and infrastructure policies and frameworks that are specifically meant to improve the climate resilience to in the national housing sector. This will ensure that the houses supported through this program will be more climate resilient to climate hazards and thus reduce vulnerability. The program will promote a financial sustainability support system to beneficiaries through a competitive loans program that is ~~center~~centreed on building resilience, financial independence, while benefiting some of the most vulnerable and marginalized populations of Belize to climate hazards.

Output 3.3: At least 10 public buildings designated as hurricane shelters or utilized during storms are reinforced and upgraded to provide safe and reliable refuge during extreme weather events.

~~126.~~128. This activity will complement the retrofitting and resilient housing initiative by providing grant financing to reinforce and upgrade at least 10 public buildings designated as hurricane shelters or utilized during storms. These upgrades will ensure the shelters provide safe and reliable refuge during extreme weather events. The selection and design of these retrofits will be informed by a comprehensive vulnerability and risk assessment, to be conducted during the project preparation phase, ensuring that the most at-risk facilities are prioritized.

~~127.~~129. The retrofit work will primarily focus on enhancing the buildings' ability to withstand high winds from storms and hurricanes, as well as installing water storage and solar power systems to ensure continued operation during power outages and storm events. By strengthening critical community infrastructure alongside private housing improvements, the project creates a holistic approach to resilience, addressing both individual household safety and community-wide emergency preparedness. This activity will also be implemented through partnership with DFC.

~~128.~~130. It is estimated that investments will reach up to USD $75,000 for new resilient home construction, USD $25,000–$40,000 for retrofitting public infrastructure, and USD $15,000–$20,000 for upgrading existing homes. To ensure the project's financial ~~viability~~viability, a comprehensive financial and economic feasibility study, including a detailed financial model, will be conducted during the development of the full funding proposal.

Output 3.4: Local actors are empowered with the knowledge and skills to build and maintain resilient structures.

~~129.~~131. This output will be accomplished by empowering local actors, with a strong emphasis on gender inclusivity, with the knowledge and skills necessary to build and maintain resilient structures, thereby strengthening community resilience. Comprehensive training programs will be designed to actively include

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women, small-scale builders, contractors, and community members, focusing on climate-resilient construction techniques that improve the durability of homes and public buildings against storms and hurricanes. These programs will be supported by user-friendly manuals and guidelines tailored to local contexts, ensuring accessibility for all participants.

~~130.~~132. Workshops and community engagement sessions will specifically encourage the participation of women and marginalized groups, fostering inclusive dialogue and decision-making around resilient building practices. Targeted information campaigns will promote storm-resilient designs broadly, with materials and messaging crafted to reach diverse audiences and address gender-specific needs and challenges.

~~131.~~133. Builders, including women builders where applicable, will be equipped with up-to-date data and technical information to advise clients effectively on resilient construction options suited to their environment. Transparent reporting mechanisms will capture progress and lessons learned, with a focus on measuring gender-responsive outcomes to ensure continuous improvement and equitable benefits across communities. This inclusive approach will help build a culture of resilience that empowers all community members, regardless of gender.

Component 4: Enabling environment for climate actions in Belize enhanced

~~132.~~134. Component 4 is meant to overcome barriers and limitations that may adversely impact the successful implementation of climate focused projects. It will seek to break gender, social, communication and coordination barriers, especially at the national level. It will complement the project components, and create the enabling environment to promote synergies and complementarity with other national and regional initiatives. This approach will ensure an impactful investment from the Fund in Belize, benefiting the most vulnerable and marginalized populations, while supporting those in a better social and financial position to implement climate smart initiatives.

Output 4.1 Enhance national awareness for impactful climate investments in Belize

~~133.~~135. This output will support the awareness building of the project interventions with beneficiaries, direct and indirect to enhance stakeholder engagement and buy in. It will complement the project component activities and stakeholder engagement, with targeted communication and awareness building campaigns, highlighting the project interventions at national, regional and international stages.

~~134.~~136. All communication and awareness building activities will be designed, developed and implemented with a strong focus on gender and indigenous stakeholder inclusion approach, which will be representative and means of breaking barriers and enhancing synergies.

Output 4.2 Enhance the capacity of regulating agencies in Belize to promote and create an enabling environment for climate interventions.

~~135.~~137. The output will seek to enhance the national coordination of governmental and non-governmental agencies to ensure alignment with national, regional and international commitments and strategies that promote impactful climate investments in Belize. The project is cross-sectoral, which often comes with the risk of limited coordination amongst relevant actors, this output will create the enabling environment, institutionally and structurally, bringing the gaps that are promoted by unchecked barriers and limitations.

~~136.~~138.

Adaptation Pathway

~~137.~~139. The adaptation pathway for this project follows a structured, phased approach that builds Belize's resilience to climate-related hazards by progressively addressing institutional, technical, and community-level vulnerabilities. The pathway begins with strengthening the foundational capacity of national institutions, specifically NEMO and the Belize National Meteorological Service, through investments in early warning systems, risk data management, and forecasting infrastructure. These foundational improvements enable more accurate, timely, and coordinated disaster preparedness and response.

~~138.~~140. Simultaneously, the pathway expands to local implementation by enhancing community-level capacity through training, retrofitting critical emergency infrastructure, and localized disaster risk planning. As institutional and technical systems are fortified, the project advances to support long-term resilience through an innovative finance mechanism, which provides accessible funding for climate-resilient housing and infrastructure. By addressing financial barriers and encouraging private and public investment in resilient construction, the pathway facilitates adaptive behavior at the household and community level.

~~139.~~141. Over time, these combined interventions reduce systemic risk, strengthen adaptive capacity, and establish a sustainable model for responding to the increasing frequency and intensity of hurricanes and other climate impacts in Belize. The pathway is iterative and flexible, enabling adjustments based on new

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climate data, lessons learned, and changing local needs, ensuring that resilience gains are maintained and scaled over the long term.

~~140.~~142. Overall, the project is expected to directly benefit more than 5,000 people and indirectly enhance resilience for over 350,000 individuals across the country with significant potential to scale across the Caribbean (detailed assessment of indirect and direct beneficiaries will be conducted during the development of the FP).The 350,000 indirect beneficiaries are those that will be directly impacted through the enhanced disaster risk response and the capacity of relevant agencies to provide vital public services improved through the project, and the indirect benefits of having a coordinated approach to climate hazards response in Belize.

B. Describe how the project/programme provides economic, social and environmental benefits, with particular reference to the most vulnerable communities, and vulnerable groups within communities, including gender considerations. Describe how the project/programme will avoid or mitigate negative impacts, in compliance with the Environmental and Social Policy and Gender Policy of the Adaptation Fund. Benefits to

~~141.~~143. As described above, Belize is increasingly vulnerable to the devastating impacts of storms and hurricanes, which frequently result in the destruction of homes, displacement of families, and long-term disruption to communities. The proposed program directly addresses these risks by strengthening national and community-level capacities to monitor, prepare for, and recover from such extreme weather events. By prioritizing household-level resilience, especially for the working poor and those vulnerable to poverty. The program also ensures that populations, such as indigenous persons, single mothers, persons with disabilities, and children, are better protected from the destruction of their homes and the loss of security that follows. These align with AF outcome 1, 2, 3 and 4 by targeting building the adaptive capacity in coastal areas and strengthening local and institutional structures in an effort to building national adaptive capacity in natural disaster preparedness and climate resilience of some of the most vulnerable. The program will be developed as a USP as a revolving fund that will focus on a loan scheme, which will target coastal areas, but the direct beneficiaries will be based on the developed criteria during full proposal development.

Social Benefit

~~142.~~144. The program is specifically designed to support the most at-risk households at all stages of a disaster with a strong focus on minimizing vulnerability and enhancing resilience. In areas frequently impacted by severe storms, the initiative invests in risk-informed housing upgrades and construction, the development of safe and accessible emergency shelters, and inclusive disaster risk planning that considers the specific needs of different population groups. A key component of the program is its gender-responsive approach, acknowledging that women, particularly those heading households, often bear a disproportionate burden during recovery while facing systemic barriers to resources and decision-making. Emergency shelters will be designed to ensure safety and dignity for women and children, and post-disaster recovery efforts will intentionally include women in leadership roles, community planning, and rebuilding activities.

~~143.~~145. In addition to improving safety and resilience, the program will realize significant social benefits by reducing the displacement of families, especially female-headed households and the elderly male, during and after disasters. Minimizing displacement not only enhances physical safety, including protection from risks such as sexual exploitation, but also promotes continuity in essential services such as education. To address broader issues of access, gender inequality, and discrimination, the project will apply carefully developed beneficiary selection criteria grounded in comprehensive assessments conducted during both the design and implementation phases. These assessments will also inform the validation of risk profiles and the development of effective mitigation strategies.

~~144.~~146. Recognizing that climate-related events can push those on the margins of poverty further into hardship, the program targets the working poor and households most vulnerable to economic shocks. Housing, often a family's most critical asset, will be a primary focus of investment. By reinforcing and protecting this asset, the program helps prevent vulnerable families from sliding into poverty, delivering long-term social benefits and supporting more equitable and resilient development across Belize.

Economic Benefit

~~145.~~147. The destruction of homes represents a significant setback for both families and national development. This program addresses the issue by promoting resilient construction practices, ensuring that homes are better equipped to withstand future storms and reduce recurring economic losses. It also enhances disaster preparedness through improved monitoring and early warning systems, enabling quicker, more equitable responses and ensuring that emergency aid reaches affected communities promptly.

~~146.~~148. During the recovery phase, the program supports job creation through community-based reconstruction efforts, offering training and employment opportunities in resilient building techniques and will target women, youth, and local tradespeople. By creating more inclusive economic opportunities, the program stimulates local economies and builds long-term resilience.

~~147.~~149. Compounding the challenge of rebuilding is the limited access to affordable financing, particularly among marginalized groups. Inequity in accessing finance remains a major barrier. In indigenous communities, where land and property ownership are often male dominated, this disparity is even more pronounced. Addressing these financing gaps, by improving access to affordable, inclusive credit and promoting gender-equitable lending practices, not only supports equitable recovery but also yields broader economic benefits. Increased financial inclusion enables more people to invest in resilient housing and livelihoods, ultimately strengthening the economy and reducing vulnerability to future disasters.

Environmental Benefit

~~148.~~150. The program promotes sustainable housing solutions and environmentally responsible rebuilding practices. All retrofitting and reconstruction efforts will adhere to the Belize Building Act, guided by the 2024 Belize Building Code. This updated code supports the design, planning, permitting, and construction of resilient building structures and dwellings, integrating climate resilience, energy efficiency, and zoning regulations, while accounting for Belize's unique environmental and socio-economic context.

~~149.~~151. In addition, the Belize National Land Use Policy (2025–2033) will be applied to ensure land development respects ecological preservation principles. This includes avoiding damage to sensitive ecosystems such as mangroves, forests, and coastal zones, which serve as natural buffers against storms. These efforts will be further supported by the Development Finance Corporation's (DFC) Environmental and Social Screening, along with a comprehensive Environmental and Social Impact Assessment (ESIA) to be conducted as part of the full funding proposal.

~~150.~~152. The ESIA will be used to clearly assess potential risks related to the protection of natural habitats, conservation of biological diversity, pollution prevention, and resource efficiency. Where risks are identified, an Environmental and Social Management Plan (ESMP) will outline targeted mitigation measures to avoid or minimize adverse impacts. To further address resource efficiency, a waste management plan and/or a resource efficiency plan will be developed for the project, with particular emphasis on managing construction waste responsibly.

~~151.~~153. Where project activities involve the installation of monitoring stations within waterways, protocols and best practices will be developed in close coordination with the National Hydrology Service. These best practices will be strictly followed during implementation to protect water resources and related ecosystems. The program will also prioritize the use of eco-friendly and durable materials for housing repairs. This approach not only supports environmental sustainability but also contributes to long-term resilience against climate-related threats and reduces the need for future reconstruction.

~~152.~~154. Disaster preparedness and monitoring are central to the program's success. Investments will be made in real-time storm tracking systems, early warning mechanisms, and community-based education campaigns to ensure households are informed and prepared for incoming storms. Local disaster response teams will receive training to support evacuations, distribute emergency supplies, and provide immediate assistance to affected families. Furthermore, the program will incorporate hazard mapping and risk assessments into housing and infrastructure planning. This proactive approach helps prevent reconstruction in high-risk areas, significantly reducing long-term exposure to disaster risks and promoting safer, more resilient communities.

C. Describe or provide an analysis of the cost-effectiveness of the proposed project/programme.

~~153.~~155. The following provides a comparison of the proposed components against viable alternatives aimed at achieving the same impact, emphasizing economic considerations wherever possible. The cost-effectiveness cannot be accurately calculated as the concept note is being developed as a USP where beneficiaries are not identified nor the locations established. This will be further developed during the full proposal development. This will be based on the consultations that will be carried out during that phase.

Viable Alternative	Assessment of Alternative Cost Effectiveness

Component One: Enhance the Capacity of Belize's National Emergency Management Organization This component strengthens national capacity to manage hurricane risks by improving institutions, coordination, and readiness across all disaster phases. It equips NEMO with the tools, systems, and infrastructure needed for timely preparedness, effective response, and resilient recovery.	
Business -as -usual and or Do nothing	If actions are not to improve early warning systems, the country will face significantly increased vulnerability especially among high-risk communities and critical infrastructure. Without effective early warning systems, the ability to detect hazards, analyze risk data, and communicate timely alerts will remain weak, leaving populations unprepared and exposed to the full force of hurricanes and other hazards. This lack of preparedness could lead to delayed evacuations, disorganized emergency response, and a higher risk of loss of life and livelihoods. Vulnerable groups including those in informal settlements, low-income areas, and hazard-prone coastal zones—would be disproportionately affected. The destruction of homes, schools, health facilities, and essential infrastructure would not only cause human suffering but also result in massive economic losses. From a cost-effectiveness perspective, investing in early warning systems offers high returns. Timely warnings reduce damage and save lives at a fraction of the cost of post-disaster response and recovery. Strengthening the National Emergency Operations ~~Center~~Centre, improving real-time data processing, and ensuring inclusive and accessible communication help minimize disruptions, lower emergency spending, and protect development gains. In contrast, inaction would lead to escalating disaster response costs, slower recovery times, and increased poverty and inequality. Strengthening early warning systems is therefore cost-effective investment in resilience and sustainable development.
Business -as -usual and or Do nothing	If these actions are not taken to establish a Management Information System, national vulnerability to storms and hurricanes will increase significantly. Without enhanced data accessibility, coordination, and informed decision-making, disaster management efforts will remain fragmented and inefficient. The absence of a national common operating picture platform will leave real-time information siloed across agencies, resulting in slower response times, miscommunication, and poor situational awareness during emergencies. This lack of coordination will critically undermine NEMO's ability to respond effectively to severe weather events. It could lead to delayed evacuations, duplication of efforts, inefficient use of limited resources, and uncoordinated delivery of emergency services. High-risk communities would be disproportionately affected, facing greater exposure to injury, displacement, and destruction of homes and livelihoods. The human and economic costs of inaction are substantial. Damage to infrastructure, prolonged service disruptions, and extended recovery periods translate into significant public and private financial burdens. Vulnerable populations would be pushed further into poverty due to repeated asset losses and lack of timely support. In contrast, investing in a centralized, real-time coordination platform is a highly cost-effective measure. It enables faster and more targeted emergency response, reducing unnecessary expenditures, improving resource allocation, and minimizing losses. By providing a unified view of the disaster landscape, it ensures that every dollar spent on preparedness and response has greater impact. Strengthening decision-making and coordination capabilities today helps avoid far higher costs tomorrow, both in lives and in economic terms.
Business -as -usual and or Do nothing	If investments are not made in climate proofing NEMOs emergency operations ~~center~~centres and emergency warehouses, the country's ability to respond effectively to hurricanes and severe storms will be significantly compromised, increasing vulnerability for already high-risk communities. NEMO's central warehouse and designated emergency response ~~center~~centres are critical for coordinating relief operations and will remain structurally inadequate and highly susceptible to damage or destruction during major hurricanes. In the event of a severe storm, unreinforced facilities may become inoperable at the precise moment they are most needed, delaying emergency response, disrupting logistics, and limiting access to essential supplies. Power outages and lack of clean water would further cripple operations, hindering the delivery of food, medical aid, and shelter materials. Vulnerable populations would face prolonged exposure to unsafe conditions, increased risk of disease, and delayed recovery, deepening poverty and long-term social impacts. From a cost-effectiveness perspective, the failure to invest in retrofitting now would lead to far higher costs later. The repair or total replacement of damaged warehouses and operations

	~~center~~centres, coupled with the economic and human toll of a poorly coordinated emergency response, would vastly exceed the upfront investment in resilience. Furthermore, breakdowns in logistics and delays in humanitarian delivery often result in higher mortality and morbidity, as well as increased reliance on costly international aid. Conversely, retrofitting these facilities with reinforced structures, solar power, and water purification systems is a high-impact, cost-effective solution. It ensures continuity of emergency operations, reduces disaster response and recovery costs, and safeguards public investments in critical infrastructure. Ultimately, it protects lives, livelihoods, and national development gains by enabling a faster, more efficient, and more resilient response to future hurricanes.
Business -as -usual and or Do nothing	If the proposed actions to strengthen local disaster preparedness and response are not taken, communities will face significantly increased vulnerability to storms and hurricanes, as well as higher long-term economic costs. Without regular training and exercises for local responders and officials, emergency response efforts are likely to be slow, disorganized, and less effective, leading to greater risk of loss of life, property damage, and disruption. The absence of a comprehensive disaster risk management curriculum will leave community members and stakeholders underprepared and unaware of essential protocols such as evacuation procedures, early warning systems, and recovery strategies. This lack of knowledge and coordination can result in chaos during disasters and slow recovery afterward. Moreover, without the development of inclusive policy and planning frameworks, local organizations, NGOs, and private sector partners will remain fragmented and underutilized in disaster management, reducing the efficiency and effectiveness of coordinated responses. Economically, the absence of tailored risk financing mechanisms, particularly for small and medium-sized enterprises (SMEs), will leave businesses vulnerable to collapse after a disaster. This is especially critical for women-led SMEs, which often face greater barriers to accessing recovery resources. Without these financial safeguards, economic recovery will be slow, job losses will increase, and local economies may face long-term setbacks. In turn, governments may be forced to allocate more funds for disaster relief and reconstruction, resources that could otherwise support development in health, education, and infrastructure. Overall, the failure to implement these preparedness measures would make disaster impacts more severe, costly, and prolonged, whereas investing in them now would greatly enhance resilience and cost-effectiveness in the long run.
Component 2: Support to the National Meteorological Service for Enhanced Hurricane Monitoring and Tracking The component will improve Belize's ability to monitor and forecast hurricanes by upgrading technology, training experts, and integrating data systems. This will lead to more accurate forecasts, earlier warnings, and better preparedness for hurricane impacts.	
Business -as -usual and or Do nothing	Without investing in modern hydrological and meteorological systems under component 2, existing gaps in infrastructure and technical capacity will persist. This will undermine the accuracy of flood modeling and hurricane forecasting, resulting in delayed or insufficient early warnings. Communities will have less time to prepare or evacuate, leading to greater loss of life, more severe property damage, and higher costs in emergency response and recovery efforts. The failure to upgrade radar systems, satellite receivers, and computing infrastructure will also limit Belize's ability to process real-time data and deliver precise forecasts. Inaccurate or late warnings can significantly increase the scale of disaster impacts, making post-disaster recovery far more expensive than preventative investments. Moreover, without proper training for technical staff, new systems could be underutilized or mismanaged, wasting resources and further diminishing forecasting reliability. Not establishing an integrated data management system would hinder effective information sharing and coordinated disaster response, resulting in duplicated efforts and inefficient use of funds. In contrast, the proposed investments are cost-effective in the long run—reducing the financial burden of disaster relief, protecting critical infrastructure, preserving livelihoods, and minimizing economic disruption.
Component 3: Climate-Resilient Housing and Critical Infrastructure through Innovative Finance for Vulnerable Communities in Belize. Component 3 aims to boost community resilience by providing affordable financing for climate-resilient housing and infrastructure. It will offer low-interest loans for safer home construction in high-risk areas and grants to retrofit critical facilities like shelters and schools. By combining financial support with technical assistance, the program promotes long-term, community-led climate adaptation.	

Business -as -usual and or Do nothing	Under a "do nothing" scenario, where Component 3 is not implemented, vulnerable communities in Belize will continue to face significantly increased exposure to the devastating impacts of storms and hurricanes, along with growing long-term economic and social costs. Without accessible financing mechanisms such as the Resilient Housing Revolving Fund, low-income households will remain unable to afford the construction or retrofitting of homes to withstand extreme weather. These families, often among the working poor and most vulnerable to economic shocks, will continue to live in unsafe housing, leaving them at greater risk of injury, displacement, and long-term hardship during hurricanes or flooding events. Damage or destruction of homes due to storms can push already marginal households further into poverty, eroding their financial stability and increasing their dependence on government or humanitarian aid. Without targeted interventions, these families may be caught in a recurring cycle of vulnerability and recovery, where each disaster deepens inequality and reduces their capacity to adapt. Moreover, the absence of grant support for retrofitting critical community infrastructure such as shelters, schools, and health ~~center~~centres will reduce community resilience and hinder emergency response, compounding the human and financial costs of climate-related disasters. Economically, this inaction will lead to significantly higher recovery and reconstruction expenses compared to the relatively modest, proactive investments proposed by the program. From a cost-effectiveness standpoint, investing in resilient housing and infrastructure now is far more efficient than bearing the repeated and escalating costs of post-disaster recovery. By reinforcing and protecting the assets of the working poor, the program helps prevent downward economic mobility, delivering long-term social benefits and promoting more equitable, inclusive, and climate-resilient development across Belize. Failure to act would not only leave families and communities physically vulnerable but would also widen social and economic inequalities.

D. Describe how the project/programme is consistent with national or sub-national sustainable development strategies, including, where appropriate, national adaptation plan (NAP), national or sub-national development plans, poverty reduction strategies, national communications, or national adaptation programs of action, or other relevant instruments, where they exist.

~~154.~~156. The proposed project is strongly aligned with Belize's national and sub-national sustainable development priorities, which are outlined as follows:

- Belize's Third National Determined Contribution NDC 3.O

The proposed project is highly complementary to the adaptation targets and actions outlined under Belize's NDC 3.0 for the Human Settlements and Infrastructure sector. Specifically, the project directly supports the development of a disaster risk response plan for vulnerable settlements by strengthening the capacity of the National Emergency Management Organization (NEMO) to plan for, respond to, and recover from climate-related hazards such as hurricanes and flooding. Through improved emergency protocols, community engagement, and institutional coordination, the project enhances Belize's ability to protect coastal and low-lying communities that are increasingly exposed to sea level rise and saltwater intrusion.

Additionally, the project contributes to the goal of developing and implementing a resilience infrastructure plan for flooding and hurricanes. It does this by providing grants to retrofit critical public infrastructure such as schools, shelters, and health ~~center~~centres, to meet climate-resilient standards, ensuring they remain functional during and after disasters. The establishment of the Resilient Housing Revolving Fund further complements this target by facilitating access to low-interest financing for vulnerable households to build or upgrade homes to withstand extreme weather events, thus reinforcing national efforts to reduce the physical and social impacts of future storms.

The project also aligns closely with the NDC 3.0 target to develop a centralized and automated multi-hazard national early warning system by 2030. Through the modernization of Belize's meteorological and hydrological infrastructure, including upgraded radar systems, satellite receivers, high-performance computing tools, and a centralized data management system, the project lays the groundwork for a more accurate, timely, and integrated early warning system. This system will improve real-time hazard monitoring and communication, enabling more effective and proactive disaster risk reduction across the country.

- Medium Term Development Strategy (MTDS) 2022–2026

~~155.~~157. The proposed project is closely aligned with the goals of Belize's Medium Term Development Strategy (MTDS) 2022–2026, particularly its focus on rural transformation, poverty reduction, and climate resilience. By investing in climate-resilient housing and infrastructure in vulnerable communities, especially in rural areas, the project supports the MTDS objective of improving infrastructure such as roads and homes. Through the Resilient Housing Revolving Fund, it provides affordable and accessible financing for low-income households to retrofit or rebuild homes to withstand hurricanes and flooding. This aligns with the government's commitment to ensure that those without resources have access to decent housing, land security, and protection from climate-related shocks. The project also directly supports the MTDS goal of enhancing social protection by safeguarding housing from damage and loss, helping prevent vulnerable families from falling deeper into poverty.

~~156.~~158. Furthermore, the project promotes the adoption and implementation of the ICC building, residential, and zoning codes by ensuring that housing and infrastructure improvements adhere to climate-resilient construction standards. This contributes to the institutionalization of safer, climate-smart development practices across the country. The project also enhances education, awareness, and capacity-building around climate change and disaster risk reduction, another core priority of the MTDS. Through technical training, public outreach, and the development of an integrated early warning system, the project empowers institutions and communities to better anticipate, prepare for, and respond to natural disasters. In doing so, it not only strengthens Belize's adaptive capacity but also supports inclusive, sustainable development in line with the MTDS's overarching vision of improving the quality of life for all Belizeans, now and in the future.

- Horizon 2030 (2010-2030)

~~157.~~159. The proposed project aligns strongly with the vision and priorities outlined in Horizon 2030, Belize's first long-term national development framework. Horizon 2030 emphasizes building a resilient economy and caring for the natural environment as key pillars of national progress. The project directly supports these goals by enhancing the country's capacity to prepare for, respond to, and recover from climate-related disasters, particularly hurricanes and flooding, which are expected to intensify due to climate change.

~~158.~~160. By investing in early warning systems, upgrading meteorological and hydrological infrastructure, and strengthening institutional disaster response capacity, the project contributes to the Horizon 2030 vision of climate-resilient communities that are better equipped to manage environmental risks. The targeted support for coastal and vulnerable communities, many of which are on the frontlines of sea level rise and storm impacts, reflects Horizon 2030's call to address the unique challenges of high-risk areas through environmentally sustainable development planning.

~~159.~~161. In addition, the project's financing mechanism helps build a more resilient and inclusive economy by enabling low-income and marginalized households to invest in durable, climate-resilient housing. This not only protects families from physical and economic displacement but also supports long-term social stability and economic recovery in the aftermath of climate events.

~~160.~~162. Moreover, while the primary focus of the project is adaptation, it complements Horizon 2030's broader sustainability goals, such as promoting sustainable energy and low-carbon development, by encouraging climate-smart construction practices that can integrate renewable energy solutions like solar power. Overall, the project reflects the core principles of Horizon 2030 by promoting environmental stewardship, reducing vulnerability to climate change, and fostering a more resilient and sustainable future for all Belizeans.

- National Climate Change Policy, Strategy and Master Plan (2021-20250)

~~161.~~163. The proposed project is closely aligned with several strategic actions outlined in Belize's National Climate Change Policy, Strategy, and Master Plan (NCCPSMP) 2021–2025, particularly those targeting human settlements, infrastructure resilience, and disaster risk reduction. It supports Action A6.1.1 by focusing on the most vulnerable communities and infrastructure, using risk-informed planning to guide resilient housing investments and community-level interventions. These efforts directly contribute to integrated development planning that reflects the needs of local populations exposed to climate hazards. Additionally, the project promotes the use of updated building codes and climate-resilient standards, advancing Action A6.1.2, which calls for the implementation of climate-sensitive land use policies. This is especially relevant for rural and indigenous communities, aligning with the National Climate Resilience Investment Plan's goals for environmentally responsible infrastructure development.

~~162.~~164. In terms of disaster preparedness, the project contributes to Action A12.1.2 by enhancing NEMO's

capacity to update and test national evacuation and disaster risk management plans, using improved climate models and vulnerability assessments to better identify and protect high-risk areas. It also addresses Action A12.1.3 through investments in advanced weather monitoring and forecasting technologies, such as upgraded radar systems and satellite receivers, which are essential for establishing a robust national early warning system capable of triggering timely alerts for hurricanes, storm surges, and other natural hazards. Furthermore, the project supports Action C12.1.2 by strengthening public access to risk information through the enhancement of NEMO's digital platforms, contributing to the development of an integrated information system that educates and informs citizens about climate risks and disaster response. Together, these activities ensure the project is well-aligned with the NCCPSMP's goals of building institutional capacity, improving climate resilience, and supporting inclusive, risk-informed development across Belize.

- Loss and Damage Framework

~~163.~~165. The proposed project aligns closely with the objectives and emerging priorities of Belize's Loss and Damage (L&D) Framework, which is currently under development under the leadership of the National Climate Change Officer with support from United Nations Development Programme Belize Country Office. While the framework is still being finalized, its core focus, identifying priority areas for climate-related losses and quantifying irremediable damage, is directly addressed by the project's emphasis on disaster risk reduction, early warning systems, and resilient infrastructure.

~~164.~~166. The project proactively reduces the risk of future losses and damage by strengthening the country's capacity to monitor and respond to extreme weather events. By investing in advanced meteorological and hydrological systems and improving early warning capabilities, the project helps limit both economic losses (e.g., damage to homes, infrastructure, and livelihoods) and non-economic losses (e.g., loss of life, displacement, and impacts to community well-being) associated with hurricanes and flooding.

~~165.~~167. Furthermore, the Resilient Housing Revolving Fund and infrastructure retrofitting components directly contribute to minimizing avoidable loss and damage, particularly in high-risk and low-income communities. These interventions protect critical assets and reduce long-term recovery costs, aligning with the anticipated aims of the L&D Framework to build resilience and reduce the burden of climate-induced harm on the most vulnerable.

~~166.~~168. As the national L&D framework evolves, this project can serve as a foundational model for integrating L&D considerations into climate adaptation programming—demonstrating practical approaches to quantifying and addressing potential losses while building long-term resilience. Its alignment with L&D priorities positions it to complement and inform the national framework once finalized.

- Climate Finance Strategy of Belize (2021-2026)

~~167.~~169. The proposed project closely supports several key elements of Belize's Climate Finance Strategy (2021–2026), particularly those outlined under Core Strategic Direction 01 and Core Strategic Direction 05, by integrating climate adaptation priorities with national development planning and advancing climate-resilient infrastructure investments.

~~168.~~170. Under Core Strategic Direction 01: Priority Financing for Climate Change Adaptation and Resilience Building, the project prioritizes financing for climate-resilient infrastructure and housing, particularly in vulnerable and underserved communities. By aligning these investments with broader development goals such as rural transformation, poverty reduction, and social protection. The project helps maximize adaptation co-benefits while strengthening critical public infrastructure (e.g., shelters, schools, and health facilities). Additionally, the establishment of the Resilient Housing Revolving Fund reflects the strategy's goal to identify and mobilize relevant financing mechanisms for adaptation, leveraging concessional loans and grants to enable low-income households to invest in resilient housing.

~~169.~~171. In alignment with Core Strategic Direction 05: Climate Proofing of Development Investments, the project advances the goal of climate-proofing both existing and planned infrastructure through direct retrofitting of critical community buildings and promotion of climate-resilient construction standards. It also contributes to raising awareness among key stakeholders—including public institutions, local authorities, and financial intermediaries such as the Development Finance Corporation —about the importance of climate-proofing, risk-informed planning, and resilience financing. By integrating capacity-building and community outreach into its implementation model, the project addresses the cross-cutting need for sector-wise awareness, in line with the strategy's emphasis on engaging sectors like banking and insurance in adaptation efforts.

~~170.~~172. Furthermore, the project lays the groundwork for the development and operationalization of national climate-resilient infrastructure guidelines by aligning retrofitting activities with the ICC building

and zoning codes, reinforcing national efforts to standardize climate-proofing across public and private sector investments.

E. Describe how the project/programme meets relevant national technical standards, where applicable, such as standards for environmental assessment, building codes, etc., and complies with the Environmental and Social Policy of the Adaptation Fund.

~~171.~~173. The project will also be guided by Belize's national laws, policies, and technical standards to ensure compliance. It will adhere to approved building codes, zoning regulations, and land use policies to ensure all infrastructure and housing upgrades are safe, sustainable, and climate resilient. These are as follows:

- Environmental Protection Act Chapter 328 of the Substantive Laws of Belize Revised Edition 2020

~~172.~~174. All project activities will be fully compliant with Belize's Environmental Protection Act (EPA) and its associated regulations, which provide the legal foundation for environmental governance in the country. The EPA, enacted in 1992 and amended in 1998 and 2009, grants the Department of the Environment (DOE) broad authority to oversee environmental protection, including pollution control, natural resource management, and environmental impact assessments. As such, the project will be implemented in strict adherence to all applicable provisions of the Act and its supporting regulations, including the Environmental Impact Assessment Regulations (S.I. 107 of 1995), the Effluent Limitations Regulations (S.I. 94 of 1995), and the Pollution Regulations (S.I. 56 of 1996).

~~173.~~175. This means that all project activities will undergo appropriate environmental screening, permitting, and monitoring as required by law. The project will also support the DOE's objectives by minimizing pollution, protecting water quality, conserving natural resources, and promoting sustainable development practices. Compliance with the EPA ensures not only environmental responsibility, but also regulatory transparency and alignment with Belize's broader environmental and climate goals, including protection of sensitive ecosystems like the Belize Barrier Reef System.

- Belize Building Act Chapter 131

~~174.~~176. The project will strictly comply with and be guided by the Belize Building Code (IBC) throughout all phases of design, planning, permitting, and construction of buildings and dwellings. This ensures that climate resilience, energy efficiency, and appropriate zoning considerations are fully integrated, reflecting both the local context and current market trends. By adhering to the IBC—which incorporates internationally recognized standards from the International Codes (I-Codes) but is customized for Belize's unique environmental and social conditions—the project will uphold the highest levels of transparency, accountability, quality, and, most importantly, safety in all construction activities.

~~175.~~177. Oversight will be provided by the Central Building Authority (CBA), which is responsible for enforcing the building code through the issuance of permits, regular inspections, and enforcement of compliance measures. This alignment guarantees that all infrastructure and housing developments supported by the project meet nationally mandated standards designed to protect occupants and communities, while enhancing resilience against climate risks and promoting sustainable development.

- National Land Use Policy for Belize (2025-2035)

~~176.~~178. The project will fully comply with and be guided by the National Land Use Policy which outlines the Government of Belize's strategic policies and actions for the sustainable use, management, and development of land across the country. This comprehensive framework covers critical areas such as land cover and land use classification, ecosystem-based sustainable land management, national estate management, and human settlements.

~~177.~~179. In alignment with the Policy Framework, the project will ensure that all activities prioritize the protection and sustainable use of biodiversity, natural assets, and green infrastructure, alongside responsible integrated coastal zone management, particularly relevant for vulnerable coastal communities. Furthermore, the project will actively support knowledge building, public outreach, and stakeholder engagement to promote transparency and community participation in land use decisions. It will adhere to governance principles for land use planning to ensure that development is sustainable, equitable, and climate resilient.

- Draft National Planning and Development Bill, 2025

~~178.~~180. All structural design and construction will be guided by the recently drafted National Planning and Development Bill, 2025, which specifically focuses on promoting the development of resilient human

settlements and infrastructure with a climate consideration and long-term sustainability.

F. Describe if there is duplication of project/programme with other funding sources, if any.

~~179.~~181. The project is designed to complement, rather than duplicate, existing funding sources, aligning closely with the Government of Belize's broader strategy for climate resilience, disaster risk reduction, and poverty alleviation. This integrated approach recognizes the critical nexus between these three areas: strengthening resilience to climate impacts reduces disaster risks, which in turn prevents communities from falling deeper into poverty. Addressing all three simultaneously ensures sustainable, long-term development outcomes that protect vulnerable populations and promote inclusive growth.

~~180.~~182. While the Government of Belize has made significant progress in providing resilient housing for low-income families, a substantial gap remains for the working poor. Many in this group struggle to access financing through traditional banking channels, limiting their ability to invest in safer, more durable homes that can withstand climate hazards. This project specifically targets this underserved segment by offering tailored, accessible financing options that bridge this gap, thereby expanding the reach of government efforts and fostering more equitable resilience across all socio-economic levels.

Proposal Title	Funding Agency	Executing Entity	Areas of complementarity and coherence with current Climate Change proposal	Current Status *(proposed, under implementation or completed)*
Enhancing Belize's Resilience to Adapt to the Effects of Climate Change (2012-2014)	GCCA	GOB-MIDH	The project established two new government Authorities namely the National Climate Change Office and the National Integrated Water Resources Authority, which are now the main agencies for addressing climate change in Belize especially targeting issues of national climate change response/dialogue. The establishment of these two agencies have paved the way for projects like these in Belize	Completed
Belize City Southside Poverty Alleviation Project (Ph. 3) (2022)	OFID and GOB	GOB-MIDH	To improve the living conditions of approximately 30,000 people through the construction and/or improvement of drainage works and roads, land reclamation activities, renovation/ reconstruction of houses and youth ~~center~~centres and implementation of training programs, among other activities. This project is planned to improve the drainage system in Belize City and improve the mitigation and adaptation in response to flood, which is exacerbated by climate change in Southside Belize City, this project will focus on rural communities.	Completed
Climate Vulnerability Reduction Programme (2020)	IADB	GOB-MIDH	Interventions targeting reduced climate-related vulnerabilities of the tourism sector and flood control measures in Belize City. The program aims to improve Belize's governance for disaster risk management and climate change adaptation. Similarly this project focuses in urban areas, and the EDA project will focus in rural areas.	Completed

Enabling Gender-Responsive Disaster Recovery, Climate and Environmental Resilience in the Caribbean (EnGenDER)	GAC, FCDO, UN Women	CZMAI	EnGenDER's overall goal is to improve gender-responsive climate and disaster resilience including for women and girls and key vulnerable populations and future generations in the Caribbean. Belize's Primary Sectors are: Agriculture, Water & Coastal Communities. A strong focus of the EDA project is women and youth, it builds on this project and how women can be more actively involved in all sectors and response to climate change.	On-going
Integrated Ridge to Reef Management of the MesoAmerican Reef Eco-region (MAR2R) - Strengthening Integrated Coastal Zone Management in Belize	GEF	CZMAI	To contribute to the conservation and sustainable use of fresh water, coastal and marine shared resources in the transboundary MAR eco-region using a ridge to reef approach therefore ensuring economic benefits and sustainable means of life for participating countries and communities. To improve ICZM planning through an evaluation and updating of the Belize ICZM Plan to better incorporate and mainstream Disaster Risk Management and Climate Change Adaptation as well as to provide support to capacity building in ICZM tools. The focus on integrated coastal zone management is a key complementing aspect to this project that will target coastal communities.	Completed
Enhancing the Resilience of Belize's Coastal Communities to Climate Change Impacts	AF	NCCO, CZMAI, MIDH, NMS, NHS (PACT as IE)	The project specifically focuses on reducing climate vulnerabilities in coastal communities, with one component specifically supporting the revision of national building codes from a climate perspective.	On-going
Building Capacity for Climate Resilient Infrastructure and Sustainable Urban Land Management and Strengthening the Capacity of the Ministry of Economic Development for pre-Accreditation to the Green Climate Fund	GCF	MET and BAPP	The project focused on building national capacity in human settlement and infrastructure from a climate perspective, including the development of legislative framework to guide climate resilient development	On-going

G. If applicable, describe the learning and knowledge management component to capture and disseminate lessons learned.

~~181.~~183. The project is designed to ensure lessons learned during project implementation to systematically capture, analyze ~~generate, manage~~, and disseminate knowledge and information across all three of its core components to improve future interventions and promote sustainability. ~~,~~ These ~~ensuring that~~ lessons learn~~ed~~, data insights, and best practices will be~~are~~ shared at the local, national, and regional levels~~.~~ ~~This commitment to inclusive and strategic knowledge management not only supports effective implementation but also~~ to establish~~es~~ a strong foundation for scaling and replication across the Caribbean, a region highly vulnerable to storms, hurricanes, and the escalating impacts of climate change.

182. 184. A Stakeholder Assessment and Consultation Plan will be developed during the full proposal preparation phase to guide inclusive, participatory information management throughout implementation. Notably, "Output 3.4: Local actors are empowered with the knowledge and skills to build and maintain resilient structures", is specifically designed to capture, organize, and disseminate lessons learnted from community-based activities. This includes field-tested construction methods, locally adapted solutions, and training outcomes that can inform local stakeholders and beneficiaries on resilient housing practices and social safeguards. future resilience-building efforts.

183. 185. Throughout implementation of the project, knowledge will be collected and disseminated at three key levels:

- National Level – The Ministry of Economic Transformation will document the project's successes and integrate key insights into the Government of Belize's broader sustainable development and climate resilience strategies. This will ensure that proven approaches inform future policy and program design. A project knowledge repository will be established with reports, case studies, best practices that capture insights from community engagement sessions, construction processes and environmental and social risk screening.
- Financial Sector Level – The Development Finance Corporation (DFC) will focus on sharing lessons with other financial institutions and private sector stakeholders. This aims to crowd in private investment by demonstrating viable models for financing climate-resilient infrastructure, particularly for underserved groups like the working poor proving that climate-resilient housing is not just a social good but a viable investment opportunity.
- Project Level – As the implementing entity, the Protected Areas Conservation Trust (PACT) will oversee and coordinate the overall management and dissemination of knowledge products. This includes developing a range of communication materials, such as technical reports, case studies, and human impact stories that highlight real-world benefits and community-level transformations by integrating feedback into the monitoring and evaluation system.

184. 186. Further, at the community level, NEMO and the National Meteorological Service will play a key role in empowering local actors, especially women, small contractors, and community leaders, through inclusive training programs. These programs will focus on climate-resilient construction techniques and include user-friendly manuals tailored to Belizean contexts. By building local capacity to design, construct, and maintain resilient homes and public infrastructure, the project enhances grassroots resilience and ensures that adaptation efforts are sustainable and widely adopted.

185. 187. Targeted information campaigns will further amplify outreach efforts, promoting storm-resilient housing designs and raising awareness among diverse audiences, with materials carefully crafted to address gender-specific needs and vulnerabilities through organized knowledge-sharing workshops, technical guides and use digital platforms to share success stories and innovations. Collectively, these knowledge-sharing mechanisms will help position the project as a regional model, providing scalable solutions for other Caribbean nations seeking to strengthen disaster preparedness, enhance climate resilience, and promote inclusive, sustainable development.

186. 188. Additionally, component 4 of the project will support knowledge sharing and lessons learnt through awareness building and institutional strengthening of national frameworks and institutions. This will enhance policy influence through evidence-based recommendations and replication of successful models in other vulnerable areas.

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H. Describe the consultative process, including the list of stakeholders consulted, undertaken during project preparation, with particular reference to vulnerable groups, including gender considerations, in compliance with the Environmental and Social Policy and Gender Policy of the Adaptation Fund.

187. 189. During the development of the concept note, focus groups and one-on-one interviews were conducted with a diverse range of national stakeholders to ensure the project is responsive to Belize's institutional realities and community needs. These engagements included the Ministry of Natural

Resources, National Emergency Management Organization (NEMO), Central Building Authority (CBA), Belize National Indigenous Council (BENIC), and the National Women's Commission, as well as the National Meteorological Services, the Development Finance Corporation (DFC), and RF&G insurance companies, particularly in relation to the design and implementation of the proposed Resilient Housing Revolving Fund.

~~188.~~190. Each stakeholder provided sector-specific insights that directly informed the structure and focus of the concept note. The Ministry of Natural Resources emphasized the need for adherence to land-use regulations, zoning enforcement, and public education around climate-resilient development. NEMO underscored institutional capacity building, improved disaster logistics, and shelter retrofitting. The CBA highlighted the importance of enforcing building codes, contractor training, and regulatory oversight. BENIC and the National Women's Commission shared critical feedback on the financial barriers facing Indigenous communities and women in accessing housing finance, pointing to gaps in collateral requirements, credit access, and gender-sensitive financial literacy.

~~189.~~191. The National Meteorological Services provided input on early warning systems, radar infrastructure, and data integration to support hazard forecasting. The DFC played a central role in outlining the practical design and operational considerations of the revolving fund, ensuring it aligns with local financing conditions and reaches the underserved working poor. Discussions with insurance providers also highlighted opportunities and constraints in linking climate-resilient construction to reduced premiums and broader risk-sharing mechanisms.

~~190.~~192. While the project prioritizes inclusive and comprehensive consultation, it also recognizes the importance of managing stakeholder expectations and avoiding consultation fatigue, particularly among technical agencies with limited capacity. As such, initial engagements were carefully scoped to inform the concept development process without overburdening stakeholders.

~~191.~~193. Upon confirmation from the Adaptation Fund that the project will proceed to the full proposal stage, a robust and inclusive stakeholder consultation process will be launched. This will be guided by a Stakeholder Assessment and Consultation Plan, developed during the proposal preparation phase, to ensure meaningful participation from all key groups, including those consulted during the concept phase. This structured approach will allow the project to build on strong foundations, while deepening community and institutional ownership during full project design and eventual implementation.

l. Provide justification for funding requested, focusing on the full cost of adaptation reasoning.

~~192.~~194. The IPCC 6th Assessment Report (AR6) confirms that human-induced climate change, including more frequent and intense extreme weather events, has already caused widespread adverse impacts and related losses and damages to both people and ecosystems. With high confidence, the report concludes that the most vulnerable people and systems are disproportionately affected, and that some irreversible impacts have already occurred as natural and human systems are pushed beyond their capacity to adapt. The IPCC also emphasizes that while some development and adaptation efforts have helped reduce vulnerability, the pace and scale of climate impacts, particularly in vulnerable regions, continue to outpace current adaptive capacity. This directly underscore the urgency of investing in adaptation efforts such as the proposed project in Belize, which aims to reduce the acute vulnerability of communities, infrastructure, and institutions to escalating climate risks.

~~193.~~195. Belize, as a Small Island Developing State, is already facing widespread and pervasive climate impacts, including damage to housing and public infrastructure, repeated displacement of communities due to climate change, and increasing socioeconomic losses from storms. This project targets the additional costs of adaptation required to address these challenges, going beyond baseline development needs to deliver targeted, climate-resilient interventions. By establishing a revolving national housing finance mechanism, the project will enable vulnerable households to access low-interest loans to retrofit, reconstruct, or relocate their homes (Component 3). This will reduce exposure to climate hazards and contribute directly to the Adaptation Fund (AF) Output 2.2: Targeted population groups covered by adequate risk reduction systems, and AF Output 4.2: Physical infrastructure improved to withstand climate change and variability-induced stress. These are costs that would not be incurred without the increasing threat of climate-induced extreme weather and thus are squarely within the scope of the full cost of adaptation approach.

~~194.~~196. Additionally, the project supports the strengthening of national systems, including the Belize National Meteorological Service and the National Emergency Management Organization

(NEMO)(Component 1 and 2). Investments in these institutions will improve early warning capabilities, forecasting, and response systems, enhancing Belize's ability to manage climate risks proactively. This component directly addresses AF Outcome 2: Strengthened institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses and supports integrated national adaptation planning and disaster preparedness.

~~195.~~197. The project also prioritizes local ownership and awareness through community-based training on resilient construction techniques, participatory adaptation planning, and risk communication (Component 3). These efforts contribute to AF Outcome 3: Strengthened awareness and ownership of adaptation and climate risk reduction processes at the local level, ensuring that adaptation measures are sustainable, equitable, and responsive to local needs and knowledge.

~~196.~~198. The IPCC has made it clear that climate change is driving irreversible damage and widespread vulnerability, particularly among those with the fewest resources to adapt. This project responds directly to that global warning by implementing concrete, scalable solutions that reduce exposure, build institutional and community capacity, and secure vital infrastructure against future climate threats. It exemplifies the principles of the full cost of adaptation by targeting those costs that exceed development needs and is fully aligned with multiple Adaptation Fund outcomes and outputs. Investment in this initiative is essential to safeguarding lives and infrastructure in Belize in the face of an increasingly volatile climate.

~~197.~~199. The detailed program with all the supporting frameworks will be further developed during full proposal development. Note that the project activities are planned within the funding requested from the Fund. The use of national institutions, existing frameworks and capacities will be the basis of the project in-kind co-financing that Belize, through the NIE, DA and beneficiaries, will be available to the project/program.

J. Describe how the sustainability of the project/programme outcomes has been taken into account when designing the project/programme.

~~198.~~200. The sustainability of the project outcomes has been a central consideration in the project's design, ensuring that adaptation benefits are long-lasting, replicable, and nationally owned. The project is closely aligned with the Government of Belize's Low-Income Housing Programme, which seeks to provide safe and affordable housing for the most vulnerable populations. This project now compliments this existing program by targeting an under serve section of Belize population. The project enhances its long-term impact and ensures institutional continuity beyond the life of the Adaptation Fund grant.

~~199.~~201. A key sustainability mechanism is the establishment of a revolving housing finance facility, which will provide low-interest loans to working poor households. As loans are repaid, funds will be reinvested into new adaptation housing projects, creating a self-sustaining financial model that continually supports vulnerable populations over time. To further strengthen sustainability, the project has been designed to attract and coordinate private sector investments, particularly through partnerships with domestic insurance companies. These entities have been included in the project's design process and are expected to participate in the revolving fund mechanism promoting uptake of affordable climate risk insurance products. This integration creates an enabling environment for risk-informed investment and long-term market engagement in climate-resilient housing.

~~200.~~202. Additionally, the DFC will use its existing lending mechanism (Annex 1), while tailoring to the needs of making the financing accessible to marginalized and vulnerable groups. The project will also support the DCF in developing a complementary legal, financial and institutional framework to align with the project needs.

~~201.~~203. The project is also aligned with Belize's national development priorities, as outlined in the Medium-Term Development Strategy and related policy frameworks that emphasize inclusive growth, climate resilience, and disaster risk reduction. By reinforcing these national objectives, the project builds on existing political and policy commitments, ensuring institutional support for sustained implementation. All housing interventions under the project will comply with national building codes and environmental regulations, promoting structural integrity, safety, and environmental sustainability. Capacity-building for contractors and builders on resilient construction techniques and compliance with these standards will further embed best practices into the construction sector.

~~202.~~204. Taken together, the elements of government alignment, financial sustainability through a revolving fund, private sector engagement, policy coherence, and regulatory compliance ensure that the project's outcomes are impactful, scalable, and owned by Belizean institutions and communities.

K. Provide an overview of the environmental and social impacts and risks identified as being

relevant to the project/programme.
The project could be considered a category B project, given its infrastructure supported activities. All the potential environmental and social impacts of the project can be mitigated and reversible.

Checklist of environmental and social principles	No further assessment required for compliance	Potential impacts and risks – further assessment and management required for compliance
Compliance with the Law	X	**Low risk:** Non-compliance with national regulatory or legal standards for land use planning and building codes. Implementation arrangements for this project will ensure that activities are completed in compliance with the law, making this risk low. **Management Required for Compliance:** As part of the ESIA process for this project, ensure that relevant national laws and institutional partners are mapped out. The project's stakeholder engagement plan should ensure consultations with relevant institutional partners like the Central Building Authority.
Access and Equity	X	**Medium risk**: Belize's vast land mass vis a vis population size means there is a low population density, with those in rural communities being far removed from services and opportunities like these provided by the housing component of the project. Traditional means of consultations may also pose access challenges for those in remote areas, persons living with disabilities and other groups from participating in key stakeholder engagement processes that inform the benefits of this project. **Management Required for Compliance:** As part of gender assessment and Environmental and social assessment, ensure there is an improved understanding of the vulnerable groups and the constraints they may face in assessing the benefits of the project. These assessments will ensure close engagement with potential beneficiary groups, including representative groups of women, youth, persons with disabilities and other groups. A beneficiary selection criterion will also need to be developed to ensure selection of beneficiaries considers a geographic distribution and non-exclusionary provisions.
Marginalized and Vulnerable Groups	X	**Medium Risk:** There is some risk that vulnerable groups with limited social capital may be excluded from opportunities relating to access to improved housing. Terms of engagement of the Revolving Finance Fund may also exclude marginalized groups. In activities related to Early warning systems, risk of exclusion based on technological selection and linguistic barriers will have to be accounted for **Management Required for Compliance:** As part of gender assessment and environmental and social assessment, ensure there is an improved understanding of the vulnerable groups and the constraints they may face in assessing the benefits of the project. These assessments will ensure close engagement with potential beneficiary

		groups, including representative groups of women, youth, persons with disabilities and other groups. A stakeholder engagement plan that includes informed mapping of vulnerable stakeholders will be necessary for project implementation.
Human Rights	X	**Low risk**: There may be discrimination in distribution of benefits. While the Constitution of Belize prohibits discrimination based on race, place of origin, political opinions, color, creed, or sex, institutional practices and norms may result in rights violations. **Management Required for Compliance:** As part of gender assessment and Environmental and social assessment, ensure there is an improved understanding of the vulnerable groups and the constraints they may face in assessing the benefits of the project. These assessments will ensure close engagement with potential beneficiary groups, including representative groups of women, youth, persons with disabilities and other groups. A beneficiary selection criterion will also need to be developed to ensure selection of beneficiary considers a geographic distribution and non-exclusionary provisions.
Gender Equality and Women's Empowerment	X	**Low Risk:** There may be uneven distribution of benefits to people of different gender groups and subgroups. These may be a result of overt or covert practices societally or at the level of executing partners. Additionally, the power dynamics at play in distribution of housing dynamics may create avenues for sexual exploitation of beneficiaries. **Management Required for Compliance:** Ensure that a gender assessment is conducted and identifies gender roles, norms, barriers and access issues. Also ensure that a SEAH assessment is done for the project. These assessments will help clarify specific actions that will allow for gender equity, minimize gender risks and empower women.
Core Labour Rights	X	**Medium Risk**: Occupational health and safety risks may be present in construction-related activities. Similarly, violation of rights related to overtime pay and payment in accordance with minimum wage laws is potentially relevant in construction related activities. **Management Required for Compliance:** Ensure that ESIA assesses occupational, health and safety (OSH) risks of the project's activities. Develop OSH plans from these assessments. The project will allow for implementation of this plan, including covering costs for personal protective equipment, training etc.
Indigenous Peoples	X	**Medium Risk**: There are potential access issues for Indigenous people in remote parts of Belize. Similarly, if the project is not well designed to consider customary land rights, there may be exclusionary activities for holders of this form of land tenure. In activities related to Early warning systems, risk of exclusion based on technological selection and linguistic barriers will have to be accounted for. **Management Required for Compliance:** Ensure meaningful consultation with Belize National Indigenous Council and other representative groups of Indigenous

		people on this project as part of the studies that will inform the final project design. Ensure FPIC process is upheld where project activities are undertaken in indigenous communities.
Involuntary Resettlement	**X**	**No Risk:** The project will not undertake activities that will acquire or require easement of private property. Activities under Outcomes 1 and 2 will be done on public lands solely. Activities under outcome 3 will require validation of land documents whether through national systems or customary practices in the Case of Indigenous People.
Protection of Natural Habitats	X	**Low Risk:** There is a low risk of the natural environment being impacted as a result of construction activities and flood modeling, forecasting tool installation. No lands under protected status will be utilized for project activities. The nature of the project activities may cause some disruption to the natural environment, albeit minimal. **Management Required for Compliance:** An ESIA will be used to assess clearly any risk related to protecting natural habitat. ESMP should clearly define mitigation measures where risks are identified. Where monitoring stations are placed within waterways, establish protocols and best practices with the National Hydrology Service. Ensure that these best practices are implemented.
Conservation of Biological Diversity	No	**Low Risk:** There is a low risk of human-wildlife conflict where construction activities are ongoing and where flood modeling and forecasting tools are being installed. **Management Required for Compliance:** An ESIA will be used to assess clearly any risk related to conservation of biological diversity. ESMP should clearly define mitigation measures where risks are identified.
Climate Change	X	**Medium Risk**: Climatic events may cause damage to or loss of weather monitoring devices, especially those placed in Rivers and waterways. **Management Required for Compliance:** Determine and implement protocols and best practices with the National Hydrology Service and the National Meteorology service for securing weather data equipment from the impacts of climatic events.
Pollution Prevention and Resource Efficiency	X	**Medium Risk:** The project presents some risk of exposure to pollutants contained in construction materials during restoration works, particularly in emergency shelters. There is also risk of improper disposal of construction debris during rehabilitative work. There is some risk, albeit small, of pollution of rivers and waterways through increased levels of turbidity during installation of flood modeling, forecasting tools. **Management Required for Compliance:** An ESIA will assess potential risks to pollution prevention and resource efficiency. A waste management plan, and/or a resource efficiency plan will be developed for the project especially related to construction waste.
Public Health	No	No risk envisioned to Public Health

Physical and Cultural Heritage	No	**Low risk:** The project may incorporate indigenous and traditional knowledge in the design of the early warning system. There is a low risk of wrongful use of indigenous knowledge acquired for the purpose of the elaboration of the EWS. Given Belize's right cultural history, there may be possibilities for encountering chance finds in construction work. This risk is however considered low since construction activities under this project will likely be rehabilitative works, specifically on Emergency shelters. **Management Required for Compliance:** Meaningful consultations with appropriate indigenous groups will be prioritized where works are done in indigenous communities. Depending on the ESIA Assessment, ensure that a Chance Finds procedure is elaborated for the project in consultation with the Department of Archaeology
Land and Soil Conservation	No	No risk envisioned to land and soil conservation. The nature of this project will not result in degradation to soils

PART III: IMPLEMENTATION ARRANGEMENTS

~~203.~~205. The project will be implemented through a country-led execution model, with the Ministry of Economic Transformation serving as the lead government partner that coordinates all national development priorities and climate response. The project will be implemented in close collaboration with the Protected Areas Conservation Trust (PACT), which will act as both the National Implementing Entity (NIE) and the Executing Entity, ensuring fiduciary management, compliance with Adaptation Fund standards, and timely delivery of project activities.

~~204.~~206. To ensure effective coordination and technical support, the project will engage key national agencies as coordination partners. The Development Finance Corporation (DFC), the National Emergency Management Organization (NEMO), and the Belize National Meteorological Service will serve as core coordination entities, each responsible for guiding and supporting specific components of the project:

- NEMO will coordinate activities under Component 1, focusing on early warning systems, disaster preparedness, and institutional capacity for hurricane response and recovery.
- The Meteorological Service will lead coordination of Component 2, which aims to strengthen meteorological and hydrological services for improved hurricane monitoring and forecasting.
- The DFC will support the implementation of Component 3, which ~~center~~centres on sustainable housing finance and the establishment and management of a revolving fund for climate-resilient infrastructure.

~~205.~~207. To ensure cross-sectoral alignment, transparency, and strategic oversight, a Project Steering Committee (PSC) will be established. The PSC will be chaired by the Ministry of Economic Transformation and will include representatives from:

- Ministry of Finance
- Ministry of the Public Service, Governance & Disaster Risk Management
- Ministry of Sustainable Development, Climate Change and Solid Waste Management
- Ministry of Infrastructure Development and Housing

This Steering Committee will provide high-level guidance, monitor project progress, and support policy alignment with national climate adaptation and development priorities.

~~206.~~208. In addition, a Technical Sub-Committee will be formed to provide expert input, review technical deliverables, and ensure coherence with sectoral strategies and environmental regulations. This Sub-Committee will include representatives from:

- Central Building Authority (CBA)
- Department of the Environment
- Ministry of Natural Resources, Petroleum & Mining

- Ministry of Human Development, Family Support & Gender Affairs
- Ministry of Constitution and Religious Affairs, Indigenous Affairs and Transportation.

~~207.~~209. These institutional arrangements are designed to promote inclusive governance, cross-sectoral coordination, and sustainability, ensuring that the project effectively contributes to Belize's national climate adaptation goals and strengthens long-term resilience across all levels of society. See implementation diagram below

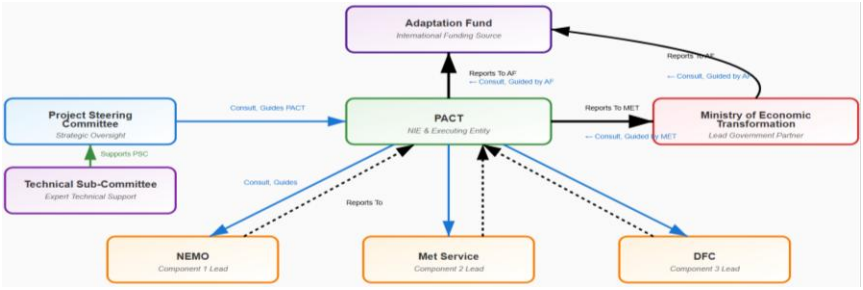

Figure 12: Project Implementation Arrangements

Flow of Funds

~~208.~~210. Funds from the Adaptation Fund will be disbursed directly to the Protected Areas Conservation Trust through a Fund Legal Agreement. As the National Implementing Entity, PACT will be responsible for the receipt, management, and reporting of these funds in line with the fiduciary and operational requirements of the Adaptation Fund. To facilitate execution at the national level, PACT will establish Memoranda of Understanding (MOUs) outlining activity-level agreements with key government agencies, including the National Emergency Management Organization, the Belize National Meteorological Service, and the Development Finance Corporation. These MOUs will define roles, responsibilities, disbursement terms, and reporting obligations (Figure 13).

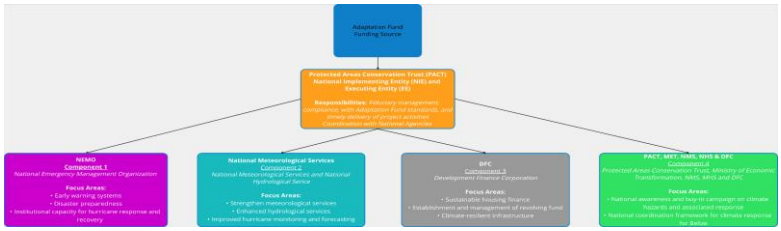

Figure 13: Flow of Funds

Demonstrate how the project/programme aligns with the Results Framework of the Adaptation Fund

Project Objective(s)1	Project Objective Indicator(s)	Fund Outcome	Fund Outcome Indicator	Grant Amount (USD)

Enhanced the capacity of the National Emergency Management Organization to effectively prepare for, respond to, and recover from hurricanes by improving institutional frameworks, emergency response protocols and infrastructure, and community engagement strategies.	% percentage increase of risk-exposed communities protected through adaptation measures # numberof people with improved access to timely early warning alerts for hurricanes and extreme weather events percentage % of women (including female-headed households) with improved access to early warning systems, disaster preparedness resources, and climate-resilient infrastructure	Outcome 1: Reduced exposure to climate-related hazards and threats	1. Relevant threat and hazard information generated and disseminated to stakeholders on a timely basis	$ 500,000
Enhanced the capacity of the National Emergency Management Organization to effectively prepare for, respond to, and recover from hurricanes by improving institutional frameworks, emergency response protocols and infrastructure, and community engagement strategies.	# number of disaster management personnel trained in climate risk analysis, data systems, and mitigation planning percentage% of participants in training and capacity-building activities who are women, disaggregated by age and leadership role percentage% of retrofitted infrastructure with uninterrupted functionality during/after extreme weather events Disaster Management Information System platform developed and operational, integrating real-time damage reporting, risk mapping, and historical data (Yes/No) # number of disaster response agencies using Disaster Management Information System for real-time data and decision-making for extreme weather events # number of climate risk assessments and early warning outputs supported by the integrated data system	Outcome 2: Strengthened institutional capacity to reduce risks associated with climate-induced socioeconomic & environmental losses	2.1. Capacity of staff to respond to, and mitigate impacts of, climate-related events from targeted institutions increased	$ 1,000,000
Strengthened meteorological and hydrological services to provide accurate and timely early warnings, enabling	# number of new or upgraded flood modeling and forecasting systems operational within national meteorological and hydrological services			$2,000,000

authorities to take proactive measures ahead of climate-related hazards.	#~~-~~ number of technical staff trained in use and maintenance of upgraded forecasting tools and infrastructure percentage~~%~~ of trained NMHS personnel who are women, disaggregated by technical role and seniority			
Enhanced the capacity of the National Emergency Management Organization to effectively prepare for, respond to, and recover from hurricanes by improving institutional frameworks, emergency response protocols and infrastructure, and community engagement strategies, while improving national awareness and buy-in of climate action	percentage~~%~~ of target communities reporting increased awareness and responsiveness to storm warnings #~~-~~ number of local institutions applying data-driven approaches to hazard preparedness and response percentage~~%~~ increase in local government capacity to respond effectively to climate-induced disasters (based on pre- and post-training assessments) Gender-responsive disaster preparedness and response protocols developed and adopted (Yes/No)	Outcome 3: Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level	3.1. Percentage of targeted population aware of predicted adverse impacts of climate change, and of appropriate responses	$ 400,000
Establish a revolving fund to provide accessible, low-interest loans for vulnerable households and communities to retrofit, reconstruct, or relocate homes and critical infrastructure to safer, climate-resilient standards	#~~-~~ number of people with continued access to essential services during disasters due to retrofitted facilities Financial management and governance structures for the revolving fund established and functioning (Yes/No) percentage~~%~~ of fund disbursements reaching climate-vulnerable households #~~-~~ number of homes in climate-vulnerable areas retrofitted, reconstructed, or relocated to meet national climate-resilient housing standards percentage~~%~~ of women-headed households benefiting from resilient housing solutions supported by the revolving fund #~~-~~ number of direct beneficiaries	Outcome 4: Increased adaptive capacity within relevant development sector services and infrastructure assets	4.2. Physical infrastructure improved to withstand climate change and variability-induced stress	$18,800,000

	(disaggregated by gender and vulnerability criteria) housed in retrofitted or constructed resilient homes # number of public infrastructure retrofitted or upgraded with flood protection, structural reinforcement, water, and energy resilience features # number of local builders, contractors, and community members trained in climate-resilient construction practices number# of knowledge products (e.g., manuals, case studies, reports) developed and shared at local and national levels			
Enhance the enabling environment for climate actions in Belize enhanced	number# of national governmental and non-governmental agencies actively involved in national climate change response strategies and plans number# of coordination meeting conducted during the project implementation period Coordination mechanism established (Yes/No)	Outcome 7: Improved policies and regulations that promote and enforce resilience measures	7.1: Climate change priorities are integrated into national development strategy	$400,000
Project Outcome(s)	**Project Outcome Indicator(s)**	**Fund Output**	**Fund Output Indicator**	**Grant Amount (USD)**
Outcome 1.1.1 National Systems for Hurricane Preparedness, Response, and Recovery Strengthened	percentage% of target population covered by adequate hurricane risk-reduction systems, including early warning services, climate-resilient shelters, and coordinated preparedness and response protocols number# of communities covered by improved warning system and weather information	**Output 1.2:** Targeted population groups covered by adequate risk reduction systems	1.2.1. Percentage of target population covered by adequate risk-reduction systems	$2,000,000
Outcome 1.1.1 National Systems for Hurricane Preparedness, Response, and Recovery Strengthened	number# of targeted institutions with increased capacity to minimize exposure to hurricane-related climate variability risks	**Output 2.1:** Strengthened capacity of national and sub-national centres and networks to respond rapidly to extreme weather events	2.1.2 No. of targeted institutions with increased capacity to minimize exposure to climate variability risks (by type, sector and scale)	$1,500,000

Outcome 2.1.1 Meteorological and Hydrological Services for Improved Hurricane Monitoring and Forecasting Strengthened	number# of climate risk monitoring tools, models, or technical guidelines developed and shared with relevant stakeholders to support improved hurricane forecasting and early warning	**Output 3.2:** Strengthened capacity of national and subnational stakeholders and entities to capture and disseminate knowledge and learning	3.2.2 No. of tools and guidelines developed (thematic, sectoral, institutional) and shared with relevant stakeholders	$500,000
Outcome 3.1.1 Sustainable Financing and Local Capacity for Climate-Resilient Housing and Infrastructure Strengthened	number# of climate-resilient housing units and critical infrastructure assets strengthened, constructed, or relocated to withstand impacts of climate variability and change, supported through sustainable financing mechanisms	**Output 4:** Vulnerable development sector services and infrastructure assets strengthened in response to climate change impacts, including variability	4.1.2. No. of physical assets strengthened or constructed to withstand conditions resulting from climate variability and change (by sector and scale)	$18,000,000
4.1.1 Enhanced national coordination and awareness on climate hazards	number# of national governmental and non-governmental agencies actively involved in national climate change response strategies and plans number# of coordination meeting conducted during the project implementation period Coordination mechanism established (Yes/No)	**Output 7:** Improved integration of climate-resilience strategies into country development plans **Output 3.1:** Targeted population groups participating in adaptation and risk reduction awareness activities	7.1: Climate change priorities are integrated into national development strategy 3.1.1 No. of news outlets in the local press and media that have covered the topic	$800,000

Annex 1: DFC Loans Program
Annex 2: Initial Gender Analysis

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PART IV: ENDORSEMENT BY GOVERNMENT AND CERTIFICATION BY THE IMPLEMENTING ENTITY

A. Record of endorsement on behalf of the government[2] *Provide the name and position of the government official and indicate date of endorsement. If this is a regional project/programme, list the endorsing officials all the participating countries. The endorsement letter(s) should be attached as an annex to the project/programme proposal. Please attach the endorsement letter(s) with this template; add as many participating governments if a regional project/programme:*

Carlos Pol *Chief Executive Officer* *Ministry of Economic Transformation and DA to AF* *(Enter Name, Position, Ministry)*	Date: 27/11/2025

B. Implementing Entity certification *Provide the name and signature of the Implementing Entity Coordinator and the date of signature. Provide also the project/programme contact person's name, telephone number and email address*

I certify that this proposal has been prepared in accordance with guidelines provided by the Adaptation Fund Board, and prevailing National Development and Adaptation Plans and subject to the approval by the Adaptation Fund Board, commit to implementing the project/programme in compliance with the Environmental and Social Policy and the Gender Policy of the Adaptation Fund and on the understanding that the Implementing Entity will be fully (legally and financially) responsible for the implementation of this project/programme.

[6] Each Party shall designate and communicate to the secretariat the authority that will endorse on behalf of the national government the projects and programmes proposed by the implementing entities.

Abil Castañeda *Executive Direct* *Protected Areas Conservation Trust/NIE* *Belize*	
Date: 27/11/25	Tel. and email: ed@pactbelize.org / +501-822-3637
Project Contact Person: Eli Romero	
Tel. And Email: cfmanager@pactbelize.org / +501-822-3637	

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PART IV: ENDORSEMENT BY GOVERNMENT AND CERTIFICATION BY THE IMPLEMENTING ENTITY

A. Record of endorsement on behalf of the government[2] *Provide the name and position of the government official and indicate date of endorsement. If this is a regional project/programme, list the endorsing officials all the participating countries. The endorsement letter(s) should be attached as an annex to the project/programme proposal. Please attach the endorsement letter(s) with this template; add as many participating governments if a regional project/programme:*

Carlos Pol *Chief Executive Officer* *Ministry of Economic* *Transformation and DA to AF* *(Enter Name, Position, Ministry)*	Date:

B. Implementing Entity certification *Provide the name and signature of the Implementing Entity Coordinator and the date of signature. Provide also the project/programme contact person's name, telephone number and email address*

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Abil Castañeda *Executive Direct* *Protected Areas Conservation Trust/NIE* *Belize*	
Date:	Tel. and email: ed@pactbelize.org / +501-822-3637
Project Contact Person: Eli Romero	
Tel. And Email: cfmanager@pactbelize.org / +501-822-3637	

ADAPTATION FUND

Revised PFG Submission Form

Project Formulation Grant (PFG)

Submission Date: September 21, 2025

Adaptation Fund Project ID:
Country/ies: Belize
Title of Project/Programme: Strengthening Disaster Preparedness, Early Warning Systems, and Climate Resilient Housing
Type of IE (NIE/RIE/MIE): NIE
Implementing Entity: Protected Areas Conservation Trust
Executing Entity/ies: Protected Areas Conservation Trust

A. Project Preparation Timeframe

Start date of PFG	AFB46
Completion date of PFG	12 months after approval

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B. Proposed Project Preparation Activities ($)

List of Proposed Project Preparation Activities	Output of the PFG Activities	US$ Amount	Budget note[1]
1. Development of Project Proposal	1.1 Project proposal in alignment with AF criteria	$25,000	1.1.1 Lead proposal development, consultant/firm: **$20,000** 1.1.2 Validation workshop for draft proposal with stakeholders: **$5,000** Budget Note: To develop a comprehensive full project proposal including all annexes, log frame, and detailed budget.

[1] The proposal should include a detailed budget with budget notes indicating the break- down of costs at the activity level. It should also include a budget on the Implementing Entity management fee use.

2. Stakeholder Consultations	2.1 Stakeholder Consultation Technical Report: Documented consultation process across coastal/urban vulnerable communities.	$2015,000	2.1.1 Community workshop (venues, materials, facilitation): **$8,000** 2.1.2 Travel & accommodation for outreach in coastal and rural areas: **$5,000** 2.1.3 Consultation facilitation team: **$7,000** Budget Note: To ensure inclusion of vulnerable groups in project design, following AF's and Gender Policy.
3. Risk & Vulnerability Assessment	3.1 Comprehensive baseline study on disaster risk, early warning system gaps and climate resilient housing needs (inclusive of gender and social vulnerability analysis)	$25,000	3.1.1 Consultant fees & report preparation & dissemination (Climate/Disaster Specialist): **$14,000** 3.1.2 Field data collection: **$6,000** 3.1.3 GIS mapping: **$5,000** Budget Note: To conduct baseline assessments of climate and disaster risk, including gender and social vulnerability dimensions to guide project design.
4. Feasibility study and Technical Design		$30,000	4.1.1 Engineering/ Architectural consultant/firm for resilient housing design standards: **$14,000** 4.1.2 Technical study on early warning

			system needs and integration and documentation: **$11,000** 4.1.3 Workshops with relevant entities: **$5,000** Budget Note: To assess technical, environmental and infrastructural feasibility of proposed interventions, ensuring sustainability and scalability.
5. Environmental & Social Safeguards & Gender Analysis	5.1 Environmental and Social Risk Assessment, Gender Analysis and Gender action Plan	$20,000	5.1.1 Environmental & Social Impact Specialist and preparation of ESMF inclusive of the associated ESMP report: **$10,000** 5.1.2 Gender Specialist & Action Plan preparation: **$6,000** 5.1.3 Field assessments for data collection: **$4,000** Budget Note: To ensure project compliance with AF's ESP and Gender Policy.
6. Economic & Financial Analysis	6.1 Cost-benefit analysis of proposed interventions	$15,000	6.1.1 Economist/ Financial Analyst Consultant & report preparation: **$12,000** 6.1.2 Cost-benefit analysis: **$3,000** Budget Note: To demonstrate cost-effectiveness and long term value of project interventions.

7. Institutional & Policy Alignment Review	7.1 Report mapping the project with national frameworks	$10,000	7.1.1 Policy/legal consultant and report preparation & validation: **$7,000** 7.1.2 Workshops: **$3,000** Budget Note: To map and align the project with Belize's national priorities
8. Management Fee	8.1 Fiduciary and financial management oversight	$7,500	8.1.1 PACT fiduciary and financial management oversight: **$7,500**
Total Project Formulation Grant		$150,000	

Please describe below each of the PFG activities and provide justifications for their need and for the amount of funding required:

1. Full Project Proposal Development: $25,000
   - A lead consultant or firm will be hired to consolidate all assessments, stakeholder inputs, and technical studies into the AF's full project proposal template. The proposal must be comprehensive, aligned with AF's technical standards and include annexes. The allocation reflects the workload for high-quality drafting, editing and facilitation of a validation workshop.
2. Stakeholder Consultations & Community Engagement: $15,000
   - Stakeholder consultations will be conducted with coastal communities inclusive of marginalized and vulnerable populations to ensure that local priorities and knowledge are reflected in the proposal. To ensure that the proposal is tailored to specific needs and given Belize's geographic spread and makeup, multiple in-person consultations are required. The budget will cover workshop logistics, community stipends, facilitations, and translation services (if needed) to guarantee inclusive participation.
3. Risk & Vulnerability Assessment: $25,000
   - This activity will establish the baseline conditions of climate vulnerability, disaster exposure and social sensitivity in targeted communities. It will include GIS mapping of hazard-prone areas, collection of socio-economic data and analysis of gender and social vulnerabilities. The development of project proposal requires robust evidence of who and what is most at risk. Given the focus of the project, such assessments are essential to prioritize interventions. The allocation covers consultancy fees for specialists, data field collection and mapping tools.
4. Feasibility Studies and Technical Design: $30,000
   - This activity will include technical assessment for climate-resilient housing designs, building standards, and the integration of early warning systems at the community level. The studies will identify practical options for resilient construction and appropriate technology for disaster preparedness. Feasibility studies will ensure interventions are sound, cost-

effective and scalable. Engineering/Architectural and disaster risk specialists are needed, along with workshops to validate findings. The allocation reflects the complexity of multi-sector technical analysis and peer review.

5. Environmental & Social Safeguards & Gender Analysis: $20,000
   - An Environmental & Social Safeguard, risk screening in line with AF's ESP and a Gender Analysis will inform the preparation of a Gender Action Plan. The funding is necessary for hiring gender specialists, conducting field assessments and preparing safeguard documentation and development of a gender action plan.
6. Economic & Financial Analysis: $15,000
   - This activity will develop a cost-benefit analysis of proposed interventions to ensure economic justification. Being able to demonstrate cost-effectiveness is mandatory and will finance an economist/financial analyst to model intervention costs and benefits supported by data collection and reporting.
7. Institutional & Policy Alignment Review: $10,000
   - This activity will ensure the project is fully aligned with Belize's national and sectoral priorities. Ensuring strong alignment increases country ownership and sustainability. The financing will secure the services of a policy expert to conduct reviews and facilitate targeted workshops with relevant government agencies and policy units.
8. Management Fee: $7,500
   - PACT's Climate Finance Unit will provide fiduciary oversight, financial reporting and administrative support required to coordinate the execution of PFG activities. The 5% fee complies with AF norms and ensures adequate institutional support for transparent and accountable management of the grant.

For LLA Projects only:

If requesting additional funding for LLA projects to enable devolving decision making to the local level, please specify the activities that would directly serve to enable devolving decision making to the lowest appropriate level and enable local actors to make informed decisions on how adaptation actions are defined, prioritized, designed, and implemented:

Please provide justifications for their need and for the amount of additional funding required:

C. Implementing Entity

This request has been prepared in accordance with the Adaptation Fund Board's procedures and meets the Adaptation Fund's criteria for project identification and formulation

Implementing Entity Coordinator, IE Name	Signature	Date (Month, day, year)	Project Contact Person	Telephone	Email Address
Mr. Abil Castañeda			Mr. Eli Romero	(501) 822-3637	cfmanager@pactbelize.org

Preliminary Gender Assessment
Strengthening Disaster Preparedness, Early Warning Systems, and Climate Resilient Housing

Introduction

The intersection of gender, climate change and housing requires careful and deeper analysis particularly to promote equitable access to housing and addressing systemic barriers faced by women and marginalized groups. Similarly, while there has been some work in Belize to understand gender responsiveness and inclusion during disaster preparation, there is room for further analysis on systemic barriers that may hinder vulnerable groups from preparing and responding to climatic shocks. The preliminary assessment for Belize's Strengthening Disaster Preparedness, Early Warning Systems, and Climate Resilient Housing Project briefly presents pointed sectoral findings that may influence the ultimate design of this project. It is noted that greater investigation will be required, including through pointed consultations with representative groups of vulnerable populations to shape the ultimate design of this project. Key to a project of this nature is understanding structural inequities that inhibit women and vulnerable groups access to productive resources. It is posited that resource ownership serves as a critical input into resilience building and supports preparation and response to climatic shocks.

Context

The implementation of the National Gender Policy is a step toward fostering inclusive development in the housing sector. Belize's National Gender frameworks are aligned to International Frameworks like inter alia, the Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW) and the Begin Platform for Action. The following framework documents demonstrates the country's commitment to gender equality within the Climate Change Space:

- **National Gender Policy 2024-2030** has an overarching goal to "Achieve gender equity and equality and end discrimination against women and girls in Belize". The National Gender Policy builds on the achievements of the 2013 Gender Policy and proposed actions and indicators for closing the gaps remain open in achieving equality. The Policy focuses on six thematic areas including health, education, wealth and employment creation, gender-based violence, women in power and decision-making and organizational systems strengthening. Notably as it relates to Housing, the Policy identifies the need to increase women's access to affordable housing and land.

  National Climate Change Gender Action Plan (NCCGAP) 2022-2027 guides all government and non-government organizations, the private sector, civil society, and all citizens of Belize in the pursuance of Climate Change adaptation and mitigation to enhance the resilience of the natural resource sectors and built infrastructure and reduce potential vulnerabilities to the effects of Climate Change and variability (National Climate Change Office, 2022). The Plan highlights as a guiding principle the need to ensure equitable access and benefit sharing in climate interventions. It provides an ecosystem approach to mainstreaming gender in climate interventions that supports inclusive participation, decision making and sharing of benefits from the perspective of intersectionality.

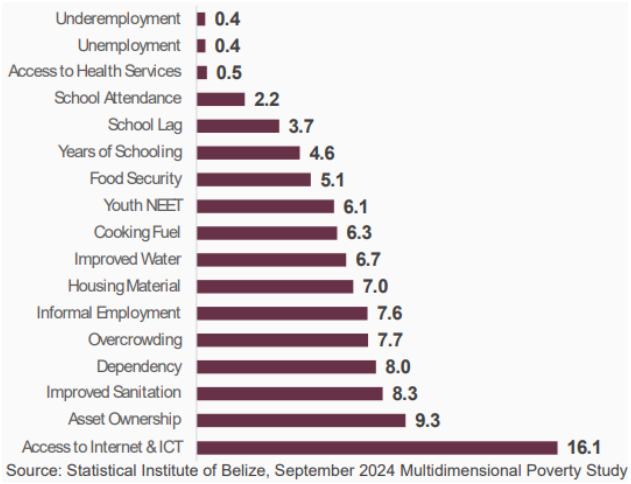
A gender-based climate resilience analysis was undertaken in 2021 in Belize under the Enabling Gender-Responsive Disaster Recovery, Climate and Environmental Resilience in the Caribbean (EnGenDER) Project. The analysis highlighted that there is dependence on livelihoods particularly vulnerable to climate change-related impacts due to temperature increases, increasing intensity of storms, sea level rise and coastal flooding, and rainfall decline and variability (CANARI, 2021). Inequality and segmentation of the labour market make it difficult for women and other disadvantaged/vulnerable groups in Belize particularly, in rural and indigenous populations, and youth to adapt to and recover from climate-related and other shocks (*Ibid*). "This

links to inequality in access to income, pointing to structural inequality facing women that must be addressed to build the resilience and adaptive capacity of communities in Belize (*ibid).*

Poverty-Gender Connection

In September 2024, 22.1 percent of the population were estimated to be multidimensionally poor compared to 26.4 percent in September 2023 (Statistical Institute of Belize, 2023). The contributions of indicators to multidimensional poverty are reflected in figure 2. Although the incidence of poverty decreased considerably between September 2023 and September 2024, the intensity of poverty remained relatively unchanged (0.4% decline) (*ibid).* Among the districts, Toledo recorded the highest percentage of multidimensionally poor persons at 67.9 percent, while the Belize District registered the lowest at 9.5 percent *(Ibid*).

Figure 1: Percent Contribution of Indicators to Multidimensional Poverty



Source: Statistical Institute of Belize, September 2024 Multidimensional Poverty Study

In September 2024, the incidence of poverty was higher in male-headed households at 23.6 percent, compared to 18.5 percent in female-headed households (*Ibid*). There were distinctions in poverty rates based on ethnicity of household head with maya households having the highest incidence of poverty (56 percent). Households with children and households with elderly persons also had higher rates of poverty. Invariably households with larger sizes also accounted for higher multidimensional incidence of poverty.

Household Headship

In 2022, Belize households increased by nearly 40% from 2010. The proportion of households headed by a female (FHH) increased from 27.7% in 2010 to 33.5% in 2022 (Statistical Institute of Belize, 2025). Conversely, households headed by a male made up approximately two-thirds of the total in 2022, down from 72.3% in 2010 (*ibid*). The average household size decreased over the census period. Notably, there are broader social changes impacting household composition, including a decline in marriage rates and a corresponding increase in common-law unions. While the poverty assessment shows better indicator performance for FHHs, the increasing rate of FHHs is a key demographic shift that influences planning for resilience building and projects of this nature.

The Elderly

The Situational Analysis of Older Persons in Belize 2010 (National Council on Ageing, 2011), found that most older persons live with family members. Living on a fixed income, or the lack of income, prevents older men and women from affording medicines, decent nutritious foods and paying bills including water bills *(Ibid)*. This was found to be more prevalent in rural areas where

more people lived and worked in the informal sectors of the economy, such as subsistence agriculture for men and domestic care work for women. Therefore, at retirement, pensions or other forms of income are limited (National Council of Ageing, 2011 as Cited in CCCCCC, 2024)

Youth and Education

The Education and Training Act legislates equitable access to education for males and females as well as students with special needs (Government of Belize, 2024). As of 2023, the compulsory school age was extended to age 16. Education is linked to development outcomes across multiple socio-economic areas. There are intersectional disparities in educational performance. The Gender Policy elucidated that male, poor, rural, disabled and migrant children are more likely to start school late, repeat a grade and drop out of school, compared to other children (Government of Belize, 2024). This then inhibits the ability of these youth to integrate into formal employment and ultimately access financial services. At tertiary education institutions, women outnumbered men at a ratio of 62:38 (*Ibid*). On the other hand, In Belize, girls comprise only 34 percent of students in Science Technology Engineering and Math related fields. Within the Technical and Vocational Education area, nationally, participation remains low. Likewise, there is a gender segmentation with male to female enrolment ratio being 3.7 to 1 (*ibid*).

Decision Making

While there have been gradual improvements in women's access to technical positions within the public sector, Belize has struggled with increasing women's participation at the highest levels of decision-making (Government of Belize, 2024). Issues of campaign financing, marketing and family and childcare responsibilities continue to act as barriers to women's political participation and their access to leadership within the public and private sectors (*ibid*).

At a household level, there are intersectional considerations that determine how decisions are made. Ethnic and cultural diversity present varied experiences on the role of women and men within households. Largely, patriarchal norms prevail within social institutions, especially in cultures and communities that hold strong religious values (CCCCC, 2023). This has implications on structural inequities that may hinder equal access to resources necessary for resilience building.

Access to Land

In Belize, the law provides for equal land access and property rights for women, but gender inequalities persist in practice, particularly for certain populations. Factors like traditional customs, lack of data, and economic deprivations are barriers to equity. Legally, women and men have equal ownership and administrative rights. There are equal inheritance rights, as well as equal administrative authority over assets during a marriage. However, despite legal equality, patriarchal customs and attitudes can influence how land is administered and inherited in practice. Amongst indigenous communities in Belize, productive land is often passed down from father to son or male relative. Hence, girls tend to be excluded from land inheritance and land ownership (CANARI, 2021). The Ministry of Natural Resources currently lacks sex-disaggregated data on land ownership, making it difficult to accurately measure the gap between legal rights and actual land access.

In 2018, a Draft Updated National Land Use Policy was developed. This Policy seeks to comprehensively address issues of land use, development, distribution, and administration, within the context of social and economic conditions and the impacts of climate change. The Draft Policy and accompanying framework seek to create a greater level of inclusivity, accessibility, accountability and transparency in land use and land management systems (Government of Belize, 2024). Among these, the policy also seeks to foster public-private

partnerships for the provision of low-income housing. Although gender issues are not specifically mainstreamed, the Gender Policy identifies that the Land Use Policy can have a positive impact on women's access to land resources (*ibid).*

Access to Financing

Men and women have differential access to Credit in Belize. Predominantly, since there are customary and cultural norms that result in more men holding the title for land ownership, women are often not able to apply for loans, or larger loans. When they are unable to access loans from legitimate institutions, women are often forced to turn to private lenders who could put women at greater financial risk due to high interest rates, and unrealistic expectations (CANARI, 2021).The report, Gender-based Climate Resilience Analysis for Belize, identified that "in rural areas, most women interested in becoming entrepreneurs are often unaware of available financing options. Men on the other hand usually have larger capital inputs or greater access to capital, as well as more exposure to a broader business community and markets. To access financial assistance, women turn to credit unions because they work readily with small farmers who do not have the collateral required by traditional lending institutions" (CANARI, 2021).

The Plan Belize Women's Agenda calls for creating a credit window within existing government lending institutions so that women can access credit that is of low interest and requires limited collateral (Plan Belize Women Agenda as cited in Government of Belize, 2024). According to DFC's five-year strategic plan, "Strategy 2021: Building Resilience Against Climate Change & Economic Volatility", DFC aims to mainstream gender and climate resiliency in all operations. The Organisation has therefore sought financing to allow for special loan products for women (Government of Belize, 2024).

Climate Information Services and Use of Emergency Shelters

Belize has assessed the early warning systems and identified critical gaps and opportunities for early warning systems for all. There are efforts to advance people-centred, multi-hazard early warning systems that reflect the needs of communities on the frontlines (UNDRR, 2025). However, there is still a need for systematic analysis on how different genders access, communicate and use warnings and alerts (CCCCC, 2025). This should be a central component in the development of climate information services (*ibid*). There is additional need to understand where different genders work along the value chain in the respective sectors to ensure that climate information services provide information that is useful to men and women along the sectoral value chains (*ibid).*

Specific statistics on shelter usage by gender in Belize during hurricanes are not readily available. Anecdotal evidence suggests that shelters are predominantly used by women, children and elderly persons. This suggests a gap in data that will better demonstrate shelter use patterns, including length of stay of various genders in shelters, and ultimately resources needed to ensure safe shelter during and post climatic events. Post disaster assessments can improve gender and social responsive reporting as a tool for learning and improving disaster preparation and response. Notably, there is focus by agencies like UNICEF and UNDRR, in collaboration with NEMO and CEMO to ensure that children and women are protected from sexual and gender-based violence post disasters.

Gender Implementation Capacity

PACT's Gender Policy is integrated into the Organisation's Environmental and Social Management Framework. Currently the Organisation M&E Officer provides gender support to the Organisation. As an accredited entity, the Organisation ensures that gender is integrated into

Projects' design and implementation. The Organisation is also in the process of recruiting specific gender capacity to improve gender mainstreaming across its portfolio.

The Government of Belize also has its National Gender Focal Point system. Gender Focal Points were appointed within Government Ministries to facilitate implementation and monitor progress. The Women and Family Services Department (WFSD) coordinates these Gender Focal Points (Government of Belize, 2024). The Project should be grounded within the national gender mechanism to ensure inclusive outputs and integration with national gender plans and policies.

Project Recommendations

This project must investigate more concretely that dynamics of gender across the project communities, given dynamic cultural norms, land tenure and decision-making processes. This will be important to elaborate an effective gender and social inclusion action plan.

Primarily, the design of a loan product under Output 3.1 should ensure that the structural barriers identified as impediments to access of resources, including access to land, are not reinforced by this project. The project will need to develop robust selection criteria that ensures increased access of women and vulnerable groups to benefits, particularly housing. Targeted selection criteria provide space to identify strategies that eliminate gender-based discrimination in housing allocation. This will align to Outcome 3.3 of the National Gender Policy. Ensuring increased access of vulnerable groups to housing requires inclusive consultations, including with vulnerable groups and their representatives. The NCCGAP provides a useful guide on the ecosystem of actors who can be incorporated into projects like these to ensure more inclusive climate action (*Figure 2*).

Figure 2: Partnership Framework

Source: National Climate Change Gender Action Plan 2022-2027

There is a need to understand where different genders work along the value chain in the respective sectors to ensure that climate information services provide information that is useful to men and women along the sectoral value chains (CCCCC, 2025). The project should explore and capitalise on opportunities to expand the reach of early warning systems, particularly to rural communities and in ways that are best understood by persons with disabilities and the elderly.

Similarly, Outputs 1.1 and 1.2 will benefit from inclusive consultation with a broader eco-system of partners, including CSOs and Ministries with responsibility for social and community development. In support of Output 1.3, the project can also tap into opportunities for improved data collection that inform gender responsiveness, including through the damage assessments.

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